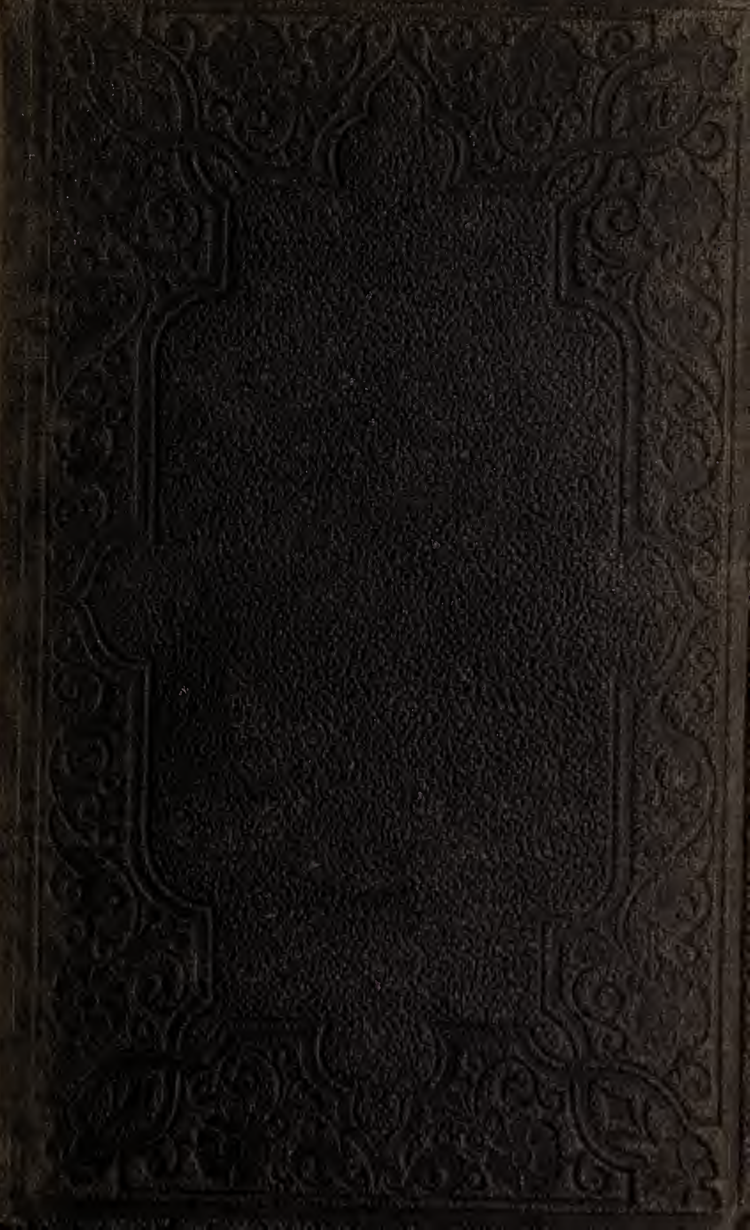

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A
FAMILIAR HISTORY
OF THE
BRITISH FISHES.

PUBLISHED UNDER THE DIRECTION OF
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APPOINTED BY THE SOCIETY FOR PROMOTING
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LONDON:
PRINTED BY RICHARD CLAY,
BREAD STREET HILL.

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BRITISH FISHES.

INTRODUCTORY CHAPTER.

The place which Fishes occupy in the mighty scale of Creation is by no means an unimportant one. Not only are they of incalculable value to man, as yielding him an abundant supply of wholesome and nourishing food, but also, in a scientific point of view, they afford a most interesting subject of study to the lovers of natural history. It is especially in this aspect that they are presented to notice in the following pages, which are written in the hope of directing the attention of the youthful student to this numerous and diversified race of beings, in whose habits, instincts, and general history he will find delightful illustrations of the wisdom, benevolence, and power of the Creator.

FISH.

The term *Fish* is employed by naturalists in a much more restricted sense than is general among persons ignorant of the science of natural history.

It is common to include under this name all the inhabitants of the water which possess a skeleton and move by fins; and it is certainly difficult to divest our minds of the idea that whales, seals, and other large animals which sport in the deep, are really fishes, as we have been accustomed to consider them.

Speaking scientifically, by a Fish is meant a vertebrated animal, inhabiting the water, having cold blood,* breathing by gills, moving by means of fins, and in general oviparous (*i. e.* egg-bearing). Now whales, dolphins, porpoises, and many other tribes of aquatic animals, breathe by lungs, and are warm-blooded animals, and are therefore perfectly distinct from fishes. They, in fact, resemble the Mammalia in their structure, and are compelled, for the purpose of respiration, to rise frequently to the top of the water, and often rest with a part of their bodies above the surface.

GENERAL FORM.

Any one who observes attentively the movements of fishes, will be struck with the perfect ease and swiftness of their passage through a dense liquid. This facility is partly occasioned by their form, which is generally that of a spindle, swelling in the middle, and tapering at the extremities. The variations from this normal form are chiefly found to exist in the case of those species which have different habits from the generality, and are designed for lying at the bottom, or burying themselves in the mud or sand, as is the case with the flat-fishes and the eel tribe. The rounded and unbroken figure of the body, without projecting limbs, is very admirably adapted for the purpose of progression through the water, and then, too, the smooth and beautiful armour in which these animals are encased tends to the same purpose. The scaly coat of mail which covers the fish's body is a dress peculiarly suited to preserve it from injury.

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* That is, the blood does not in general rise above the temperature of the water. It is invariably red.

THE SCALES.

The arrangement of the *Scales* resembles that of tiles upon a house-top, embedded, as they are, in the skin on the one side, and overlapping the succeeding ones at the other edge, thus so closely pressing upon each other that the water cannot penetrate them, and being covered, moreover, in many fishes, with a glutinous slime not soluble by water. The structure of the scales is very curious and beautiful. They are various in form, and afford admirable objects for microscopical observation. "The edges are sometimes cut into points, scallops, or waves of exquisite symmetry; the surface is often variously sculptured, and the whole presents an example of the most elaborate workmanship, worthy of the Divine hand that formed it."—(*Gosse.*)

THE FINS.

Somewhat analogous to the limbs of terrestrial animals are the *Fins*, which constitute the organs of motion. They afford, by their structure, position, and number, the means of distinguishing the orders, families, and genera of the class. Commonly there are two pairs on the under part of the body, called the *pectoral* and the *ventral* fins. These represent the fore and hind limbs of other vertebrate animals. There are also others along the back, called the *dorsal* fins, and one below, near the tail, called the *anal* or vent fin. The principal organ of motion in fishes, however, is the tail, which moves from side to side, and strikes the water with great force, while the pectoral and ventral fins assist in directing the motion of the animal, and in balancing the body.

THE GILLS.

The breathing organs—*Branchiæ* or *Gills*—are placed on each side of the head; they are composed of an innumerable series of delicate blood-vessels, arranged in a fringe-like form or in tufts, and are protected by a large bony plate, called the *Gill-cover* (operculum), composed of several pieces; the use of this is to cover the opening behind the gills. The water to be breathed is taken in at the mouth, and is ejected by this aperture.

THE AIR-BLADDER.

Fishes have no true lungs, but in many of them there is a large bladder, which is evidently a great source of buoyancy, and assists the fish in rising or sinking, and also is believed to have some relation to the breathing function. It is of very various forms, and is always filled with air. This organ is familiarly known by the name of the Sound, and the substance called isinglass is made of it.

TEETH.

The *Teeth* in fishes deserve particular attention. They vary greatly in form, arrangement, and position, but are chiefly adapted either for tearing or bruising. In the strong and formidable shark species they are large and strong, smooth and piercing, or sharp and serrated. In the rays or skates, whose food is chiefly shell-fish, the teeth are arranged like a thick pavement, fitted for crushing. In other kinds the teeth, of various size and strength, are placed in the jaws, tongue, and vomer or palate, and along the arches of the gills and the throat. The French call the latter "dents en velour" (velvet teeth), from their resemblance to the pile of coarse velvet.

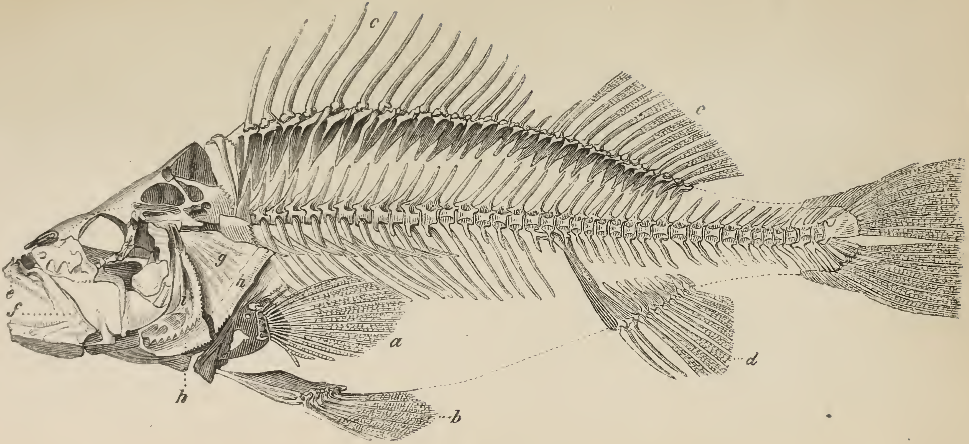
EYES.

Fishes have the *Eyes* in general very large, and very variously placed in the different species; in some they are high up, near the top of the head, but more frequently on the sides, and always so situated as to suit the peculiar habits and necessities of the animal. "The external surface of the eye itself is but slightly rounded, but the lens is spherical, a structure which, in a dense medium, affords intense power of vision at short or moderate distances, rather than long sight."—(*Gosse.*) The vision of fishes is very keen, when the water is clear and unruffled.

NOSTRILS.

Their sense of smell is also undoubtedly acute, as their olfactory nerves are of very large size. The nostrils are generally double on each side, but both openings lead to one canal.

The Common Perch is considered to exhibit the greatest general perfection of form among fishes, and,



Skeleton of the Perch.

a. The pectoral fin. *b* The ventral fin. *c c.* The dorsal fins. *d.* The anal fin. *e.* The intermaxillary bone. *f.* The maxillary bone. *g*' The operculum. *h.* The sub-operculum. *i.* The pre-operculum. *k.* The inter-operculum.

being a species familiarly known, it is well adapted to give an idea of the general structure of these animals. The figure here given of the skeleton of the Perch, shows the bony structure in osseous fishes, and will enable the reader to understand the position of the fins, and the arrangement of the jaw bones and the operculum.

HABITS OF FISH.

Less is known about the *Habits of Fish* than of most other animals; but happily every year adds something to our store of information, and brings to light particulars concerning this department of natural history fraught with interest to the lovers of that delightful science. Much curiosity especially has been of late excited by observing in those large glass cisterns or tanks, which may be called "piscinæ," the habits, modes of progression, and the seeking of food which characterise marine animals. Most persons are aware of the great pleasure afforded to the visitors at the Zoological Gardens, London, in the examination of the numerous marine and fresh-water fishes, which are seen, in full spirit and life, in those large crystal cisterns and troughs.

The absence of such facilities for research formerly caused many errors in the decisions to which naturalists arrived, and led to the putting forth of theories in works on Icthyology at variance with actual facts. For example, nest architecture has been considered almost peculiar to birds, and the nidification of some of the fishy tribes has been wholly unknown to modern naturalists; at least, they have not published anything with reference to the subject until quite recently. It had not, however, escaped the notice of Aristotle, who, above 2,000 years ago, stated that "a certain little fish constructed a nest like that of a bird." This statement of the father of systematic Natural History had been slighted as without foundation by more recent authors, who have generally asserted that fishes,—"those voiceless dwellers in the deep,"—exhibited but few marks of instinct and sagacity, and cherished no kindly affections toward their young. "Constructing no dwellings, they merely shelter themselves from danger among the cavernous rocks of the ocean, in the silent depths of lakes, or beneath the shade of the overhanging banks of rivers; and the cravings of hunger seem alone to exercise a frequent or influential action over their monotonous movements."

After this fashion the most intelligent observers of nature denied to these beautiful creatures, on whose varied forms and exquisite hues they delighted to expatiate, the strongest of Nature's instincts—that of parental care and love.

PARENTAL INSTINCT.

But that this is far from being universally the case we now know beyond a doubt, and the instances are not rare in which there is a clear manifestation of parental instinct, exhibited sometimes both by male and female, occasionally previous to the birth of the young, by the preparation of a proper receptacle or nest; and at other times afterwards, when the offspring are peculiarly exposed to peril from the innumerable foes by which they are surrounded. It is most interesting to know that there is a family of fishes * furnished by nature with the same provision as the group of mammalia called Marsupials, including the Kangaroos, Opossums, and others; that is to say, fish with a purse or bag (*Marsupium*) for the safe custody of their young, first in the egg, afterwards when further developed. But while the analogy is so far very striking, a marked difference exists in this respect, that whereas in the mammalia the marsupium is in the female, in the case of the fishes it is found in the male.

NIDIFICATION.

It has now been ascertained that various species of at least four families of osseous fishes construct nests; a striking example is supplied in the case of two species which inhabit the waters of Demerara.

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* The Pipe fishes.

The native name of these fish is *Hœssar*, and both kinds form a regular nest, in which they lay their eggs in a flattened cluster, and cover them over most carefully. In one species the nest is of grass, in the other of leaves, which they contrive to cut and collect together. Nor does their care end here ; they remain beside the nest till the spawn is hatched, and, with as much solicitude as is shown by a hen guarding her young, both parents steadily watch their charge, and courageously attack every assailant. Indeed, so bold does their parental affection render them, that the negroes frequently take them by simply putting their hands into the water close to the nest, when the male fish springs furiously at them, and so is captured.

The great Danish naturalist, Fabricius, has supplied a fact which bears on this point, respecting the Lump fish (one of our British species), which frequents the shores of Greenland, where it spawns. The male fish guards the eggs most courageously, keeping watch over them, and protecting them against every foe. " If driven from the spot by man he does not remove far, but speedily returns, and even the well-armed Wolf fish hazards his life if he approaches the Lump's nest ; for this creature, notwithstanding the smallness of its teeth, is capable of attaching itself to its adversary's neck, and there inflicting a mortal wound."

Thus, then, in different climes, from the Caribbean Sea to the frozen shores of Greenland, the same fond parental instincts have been detected in members of the finny tribes, and doubtless careful observation would add many similar instances.

But we need not have gone so far for our examples. One of the most remarkable instances occurs in the case of a species which is the resident of almost every pool, river, and rivulet in our kingdom. There is, perhaps, no species in which parental attachment has been observed to equal that evinced by the three-spined stickleback, a little fish with which we are most familiarly acquainted, and our ignorance of whose habits can therefore only have proceeded from inattention. I had myself an opportunity of observing minutely the whole process of nesting, spawning, and hatching in this fish, as will be mentioned hereafter.

To secure their young from danger, some creatures have been said to adopt modes of defence which have been questioned and even disbelieved by eminent naturalists, but which more close investigation seems likely to prove correct. The practice referred to is that of the parent animal receiving its young in case of alarm, not only into the mouth, but into the stomach, from whence they again emerge when the danger is past. The opinion that this is the habit of the Blue Shark is as ancient as the time of the poet Oppian :—

"Others, when aught disturbs the ravaged seas,
And trembling young their conscious fears express,
Extend their jaws, and show the safer way.
The frighted stragglers soon the call obey,
Within the parent roof uninjured rest,
Safe as a chirper in his mossy nest.
Thus the blue sharks, secure from chasing foes,
Within their widen'd mouths their young inclose.
They watch their fondlings like a careful nurse,
Observe their motions, and restrain their course,
Eye every wave, and show the doubtful way,
Teach where to hunt, and how to find the prey."

Œlian also expressed the popular belief of his day, in ascribing a high degree of parental attachment to this animal. "What an excellent father," he says, "do we witness in the Blue Shark; he diligently watches over his partner's offspring, and guards them from snares and injury. Whilst they swim along with the buoyancy and carelessness of youth, his anxiety continues, and sometimes he bears them on his back, sometimes moves them from one side to the other. If any of these little ones should be seized with fear, he opens his mouth to receive it, and does not disgorge it till the danger is clearly passed."

These statements have been received not only with doubt, but have been pronounced impossible, by men whose name, in matters of philosophical importance, would decide a question. But it must be borne in mind that the unprejudiced observation of facts is the only true way to attain accurate knowledge; and sometimes the diligent inquirer is rewarded by coming nearer to the truth than the more able theorist with his speculations. It is a fact that the same habit exists in the instance of the little fish before mentioned, the three-spined stickleback.

Doubtless with respect to the great majority of fish it is not easy to conceive that such care can be evinced by the parents towards a progeny so numerous as they are known to produce, amounting (according to Mr. Jesse) to more than half a million in the mackerel, to over a million and a quarter in the flounder, and to upwards of three millions in the cod. In these cases the spawn is buried in the sand or gravel for weeks and months, or wafted about on the floating wave. But while necessity thus, in the majority of cases, compels the abandonment of their progeny, it is pleasing to know that there are exceptions, proving that even cold-blooded fishes yield striking examples of highly interesting instincts, exercised for the most benevolent and beneficial purposes.

CURIOSITY.

Those observers who have most minutely watched the habits and economy of fishes, pronounce them not devoid of other pleasing characteristics. Thus Mr. Jesse, in his delightful "Gleanings," says that they are decidedly gifted with curiosity, which may be witnessed by putting some new object into the water, when they will assemble around it, and appear to reconnoitre it attentively. Carp (he says) will, especially, come up to a new fish which is put among them.

ATTACHMENT.

Considerable attachment is often manifested by them, and the same author relates that he "once caught a female pike during the spawning season, and nothing could drive the male away from the spot at which his mate disappeared, whom he had followed to the very edge of the water. A person who had kept two small fishes together in a glass vessel, gave one of them away, when the other refused to eat, and showed unmistakeable symptoms of unhappiness till his companion was restored to him."

GOLD FISH.

A lady of my acquaintance was for many years in the habit of watching the proceedings of a number of gold fish, which she kept in a large basin or cistern, surrounding a fountain in her garden. There the creatures bred freely, and were entirely at their ease, so that she had ample opportunities of observing them year by year. They became so familiarly acquainted with her voice, that so soon as they heard it they would approach her : but if a stranger spoke, they gave no sign of recognition. If she put her hand into the water they would cluster around it, and each would nibble at a finger; nay, they suffered her to take them from their native element, and to operate upon their eyes; for having observed that the eyes of several among them became gradually covered with a film, which rendered them blind, so that they were unable even to guide their way, she managed, with gentle skill, to remove the coating from the surface of the eye, and had the pleasure of seeing her patients recover their vision, and with it their health, which had drooped. At length she discovered that when supplied with sand at the bottom of the trough, the fish were no longer afflicted in this manner. They were seen to push their heads into the sand, and rub them against it, and by this means they kept their eyes clear and lustrous.

MUTUAL AID.

With a similar instinct to that observed in animals which assist each other by licking, scratching, or biting, as the case may be, fishes have been seen to seek help from their companions. Thus a stickleback has been observed to swim up to a newt in a vivarium, and to remain perfectly quiet while the newt was occupied in eating off the fungus which had been annoying the poor little fish.

PARTIALITY TO THEIR OLD HAUNTS.

Fish are very partial to certain places, and, like birds, return to their old haunts. A gentleman was for many years accustomed to mark certain fish which he caught, taking them several miles up the river, and then turning them loose. He frequently caught them a second and a third time in the same place where they were originally taken. A pike has been known to haunt the same spot under a tree during a whole summer ; and the attachment of a salmon to his native streams, like that of young pigeons to their first dove-cot, is well known, and the struggles he will undergo, from weirs and waterfalls, to reach it on returning from the sea, are equally remarkable.

VIVID HUES ASSUMED BY THEM.

The *varying colours* of fish have excited the interest of observers, and by some have been ascribed to the effect of mental agitation. The distinguished naturalist, M. Agassiz, states that during the autumn and the time of the greatest cold in the winter months, the tints of the Salmonidæ are most brilliant, and that the colours become vivid by the accumulation of great quantities of varied pigments; "so that," he adds, "it is almost true that these fishes bedeck themselves in a nuptial garment, as do birds." The pugnacious propensities of some species during the spawning time are very great, and the hues of the male fish during that season possess extreme brilliancy and beauty, which afterwards disappear.

PUGNACITY.

The ferocity and tyranny exhibited by the different species of stickleback over their vanquished foes must be seen to be credited. Previously to an encounter, the two combatants assume the attitudes of warfare, sparring, as it were, and watching for an unguarded place in the opponent, then darting at him with the utmost violence. They swim round and round each other, with their spines projected, before the assault is made. When one is defeated, and driven from the position he had appropriated to himself in his place of confinement, his gay colours fade, and he unites himself with some other brethren who have been similarly conquered, or, for some cause, have not assumed the painted attire and pugnacious dispositions of the others. This unfortunate squad is generally driven into an unoccupied corner, where they are wantonly and continually persecuted by their victorious comrades.

SKILL AND ARTIFICE.

Many kinds of fish are gifted with surprising cunning in capturing their prey, and in their methods of self-defence also. To instance only one or two cases. There is a beautiful little tropical fish, which in the East Indies is often preserved in vases for the amusement of watching its feats in archery. It feeds on flies, and its mode of securing them is very singular. It is furnished with a long proboscis or snout, from which it shoots out a drop of liquid with such force, that, aiming as it does with surprising accuracy, it knocks the insect off the leaf or spire of grass on which it was basking, into the water, where it is of course readily captured.

There is also one species called Nascus fronticornis, of which Forskall (one of the pupils of the great Linnæus) relates that, although of peaceable demeanour and herbivorous habits, it knows how to defend itself from unprovoked aggression ; and he reports the observations of some Arabian fishermen, who saw a troop of them come to the rescue of a companion that had been transfixed on the surface of the water by an eagle. They so mastered the " Bird of Jove," as eventually to effect his death by drowning.

The Grey Mullet, the Angler, the Lump fish, and others of our native fishes, are endowed with similar instincts, as we shall hereafter have occasion to observe.

It may not be uninteresting, in conclusion, to notice the extraordinary power possessed by some fishes of sustaining extremes of high and low temperature. In the hot springs and baths of various countries many species have been found to exist. Thus Bruce has related that at the ancient Thala, in the baths of warm water without the town, he saw a number of small fishes, not unlike gudgeons. Upon trying the heat by the thermometer, he was much surprised that they could have existed, or even not been boiled in such a temperature. M. Sonnerat and other travellers have reported similar instances ; the details of the degrees of heat are not stated, but many species lived for several days in water which was so hot that the hand could not be retained in it for a single minute. Still more surprising to tell, Humboldt and Bonpland, when travelling in South America, perceived fishes thrown up alive, and apparently in health, from the bottom of a volcano in the course of its explosions, together with water and heated vapour that raised the thermometer to 210 degrees, being but two degrees below the boiling point !

The power of fishes to sustain a low temperature is equally extraordinary. In the northern parts of Europe, we are told, perch and eels are advantageously transported from place to place while in a frozen state, without destroying life. Mr. Jesse has related that a friend of his, who resided near London, had a single gold-fish with the water in a marble basin frozen into one solid body of ice. He broke the ice around the fish, took it out, and found it to all appearance lifeless, and looking perfectly crystallized. This was about noon. Leaving the fish with the ice in the basin, a fire having been lighted in the room, he chanced after dinner to look at the basin, where he saw the ice partially thawed, and to his astonishment beheld the fish moving. At midnight, when he went to bed, it was as lively as usual.

The limits of this Introductory Chapter will not admit of any detailed notice on the subject of the Vivarium, Aquarium, or Piscina. The invention of preserving collections of plants and animals in fresh and salt-water, is one of very recent date. Mention has already been made of the water vivaries opened in Regent's Park, under the management of the Zoological Society, in the year 1853. Many experiments had been previously made by individuals, who succeeded in keeping sticklebacks, gold-fish, and other animals in vessels supplied with suitable plants. Particularly, a lady resident in

London frequently surprised the scientific societies by exhibiting beautiful living specimens of rare marine animals. These she succeeded in keeping many months by aërating the sea-water, by pouring it from one vessel to another.

The opening of the house in the Zoological Gardens gave a vast impetus to the establishment of vivaria, and books and papers on the subject have since abounded, which have greatly assisted in imparting the practical knowledge necessary for managing them, as well as created a taste for the study of natural history. We all know how much our museums and collections are enriched by the introduction of these water vivaries, with their beautiful and diversified inhabitants; and we have only to go and see the eager groups who cluster around them, watching their inmates with ever new interest and delight, to judge of their practical utility.

As I have already hinted, the facilities for research thus afforded have done much to put to flight the prejudices and errors formerly entertained with reference to the instincts, habits, and general history of the finny race. Naturalists have learned that they must have the "seeing eye," which watches and observes, and diligently compares, and thus gathers together many facts which militate sadly against theories, and cause us to relinquish, one by one, the generalisations which we had held so tenaciously.

An entertaining writer on natural history has well remarked that a very curious chapter might be written on what may be called "Fish paradoxes." "Thus," he says, "there are fish that fly, fish that climb, fish that hop like frogs, using their fins as veritable legs; fish that ruminate, fish that discharge electricity in sufficient intensity to decompose water, fish that migrate, fish that make nests, fish that incubate, and fish that bring forth their young alive." It may be added, that though fish do not sing, some of them emit various tones, as was known to Aristotle, who specifies six different kinds.

I must not close this chapter without reminding my readers of the frequent allusion made to the subject of fishes and the vocation of the fisherman in the sacred Scriptures. Some of the most pathetic imagery of the Prophet Isaiah, when denouncing the doom of Egypt, is drawn from the failure of the fisherman's supplies :—

> "The fishers also shall mourn,
> And all that cast angle into the brooks shall lament;
> And they that spread nets upon the waters shall languish."

But it is in the New Testament we find the most constant allusion to this subject. The fisheries of the Lake of Gennesareth were from the earliest times of high renown, insomuch that one of the Rabbinical legends reports it to have been a fundamental law of Joshua, on the division of the promised land, that all should have a right to fish with a hook in its waters. When the Saviour of mankind came forth on His mission of mercy, He chose for His disciples a band of humble fishermen, who obtained their daily subsistence from the produce of their nets. We know how, in obedience to His voice, they forsook their calling, and followed Him, that from that time they might become "fishers of men." And as He trod the shores of that lake, thenceforward to be counted the most sacred of earth's waters, how frequently did He instruct them, by imagery drawn from the familiar pursuit of their early lives, thus teaching us also to learn a lesson of wisdom, not only from the birds of the air, but from the fishes of the sea.

The fish, as a cognisance of the early Christians, is supposed to have had a twofold meaning. The first was allusive to the laver of Baptism; by the second was indicated the title of Christ, Ἰησοῦς Χριστὸς Θεοῦ Ὑιὸς Σωτὴρ, Jesus Christ, the Son of God, the Saviour. The initial letters of this title form ΙΧΘΥΣ, the Greek word signifying "a fish."

CHAPTER I.

BRITISH FISHES.

Fishes form the fourth and last class of vertebrated animals, and are divided, by Baron Cuvier, into two great series,—the Osseous, or those possessed of a bony skeleton, and the Cartilaginous, or those furnished with a cartilaginous one. That distinguished naturalist arranges the whole in six orders,—four belonging to the former series, and two to the latter.

The Osseous Series are in two great subdivisions, the *Spiny-finned* and the *Soft-finned.* The whole of the Spiny-finned are included in the first order, while the Soft-finned are divided into three orders, according to the position of the fins, or their entire absence.

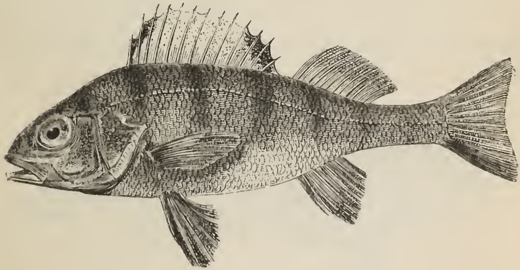
The Cartilaginous Fishes are divided into two orders,—those with free gills, and those with fixed.

FIRST SERIES.—OSSEOUS FISHES.

Order I.—Spinous-finned Fishes. (*Acanthopterygii.*)

This Order is decidedly the most highly organized, and by far the most numerous of the whole class. In M. Cuvier's arrangement, which includes the fishes of the waters of every region and clime, there are fifteen families comprehended in it, twelve of which have their representatives in the British Fauna. Of these

The Family of Perches (Percidæ) stands first. Its name is derived from the Common Perch, which is regarded as its type, or general representative. The species belonging to it are exceedingly numerous; no fewer than 500 being enumerated in M. Cuvier's great work, "The Natural History of Fishes." Of these, but ten or eleven are found in British waters. In shape, their body is oblong, and covered with scales, generally hard or rough; the opercle and preopercle are either serrated or spinous, and the jaws and throat commonly armed with teeth. Their flesh is usually wholesome and well flavoured.*



PERCH

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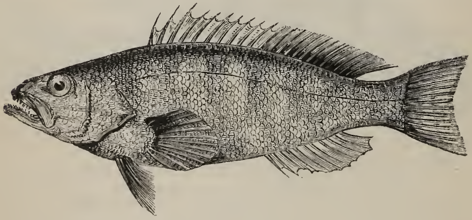
* They are, the Perch, the Basse, three species of Serranus—all three rare; the Ruffe, or Pope, the Great and Lesser Weever, and the Striped and Red Surmullet—the latter very rare.

The *Perch* is one of the most beautiful of the fresh-water fishes of Europe, but it is too well known to need description. As a species, it is common in all the temperate parts of Europe, inhabiting both lakes and rivers; and it rather likes than shuns a dash of salt water. Thus, Sir Thomas Browne says, "such as are taken on Breedon, in the mixed water, make a dish very dainty, and I think scarce to be bettered in England." This fish was much esteemed by the Romans, and one of their poets has sung its praises. It is also now-a-days in good repute, especially with the Dutch, who make of it a dish called Water Souchy.

In its habits it is a bold and familiar fish, and when in confinement will soon be sufficiently tame to take a worm out of the hand. It is gregarious, and loves deep holes and gentle streams, and is an eager biter. Perch are very tenacious of life, and will continue alive many hours if occasionally

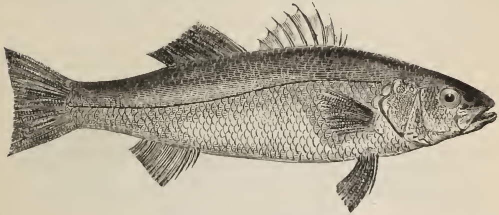


SERRANUS.

watered. Mr. Yarrell says they are constantly exhibited in the markets of Catholic countries, and if not sold are taken back to the ponds from which they were removed in the morning, to be reproduced next day. These fish are of slow growth, and although sometimes attaining a great size, the majority are smallish. A perch of 2 lbs. is looked upon as a fine fish. Some weighing 5 or 6 lbs. have been taken, and even a monster of 9 lbs. is on record as having been once on a time captured in the Serpentine River, Hyde Park.

Although better flavoured when taken from brackish water, perch will not bear real salt water; it is too strong for them.*

The *Basse*, or Sea Perch, is a fish of pleasing aspect, though destitute of the strongly contrasted colouring of its brother of the fresh waters; from



BASSE

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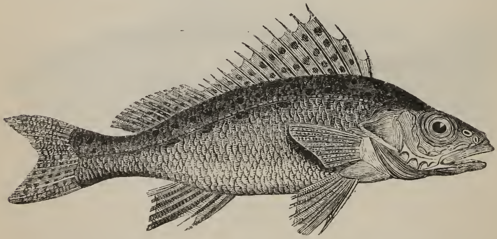
* Perch, in brackish water, meet with a species of shrimp on which they feed eagerly, and it is to this food they owe their improved flavour.

which it is also distinguished by an abundance of small teeth upon the tongue. It is found in the Mediterranean, and occasionally visits our British shores. It was well known and highly valued by the ancients; and being a bold fish, of active habits, remarkable for the size of its stomach, and very voracious, the Romans gave it the appropriate name of *lupus.* Its ordinary size is from twelve to eighteen inches in length, and the flesh is then excellent. Its food is chiefly crustacea and small fry.

The *Ruffe*, or Pope, a fresh-water fish, is closely allied to the perch, from which it is chiefly distinguished by having a single dorsal fin, the rays of which are spinous in front and flexible behind. It appears to have been known to the ancients, and was first described by Dr. Caius, who discovered it in the Yare, near Norwich. It is still found in the Norfolk rivers, in large shoals — its dull yellow colour assimilating so nearly to the gravel and sand,

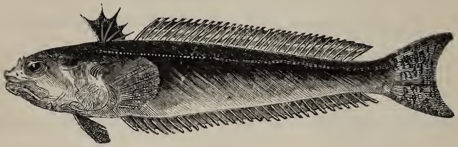


RUFFE.

in which it delights, that, even when the water is clear, the shoals are seen very indistinctly. This little fish is seldom more than six or seven inches long. In its habits it resembles the perch; and it is common in almost all the canals and rivers of England.

The two species we have next to notice belong to a genus whose name (*Trachinus*) is derived from the Greek; and the fish are called in several languages by a term that signifies *spider*, in reference to their supposed venom. They have no air-bladder, usually hide themselves in the sand, and are very tenacious of life. It is from this latter circumstance the French have given them the name of *La Vive*, and our English word *Viver*, or *Weever*, seems to be derived thence. They are well known for their formidable spines, and are a great annoyance to bathers, who frequently tread on them inadvertently, and are stung. Such is the apprehension of the consequence of these wounds, that our own fishermen invariably cut off the offending part before bringing them to shore, and the French have a police regulation to the same effect, while in Spain there is a positive law inflicting a penalty if any fish whose spines give a bad wound be brought to market without removing the fins.

The *Great Weever*, or Sting-bull, is from twelve to fifteen inches long. Its food is chiefly the fry of other fish; and its flesh is excellent. It prefers deep waters, and lives constantly near the bottom.



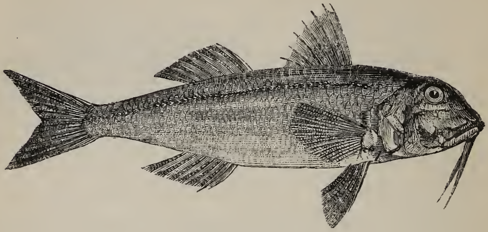
GREAT WEEVER.

The *Lesser Weever* is more frequently met with on different parts of our coast than the former; and being much smaller (seldom more than five or six inches long), and quicker in its motions, is even more difficult to handle safely. It spawns in spring, and is often taken by the shrimpers. Its subtlety in lying in wait for its prey (aquatic insects and minute crustacea) is remarkable. Burying itself in the sand, and leaving only its snout exposed, it darts with unerring certainty upon the tempting morsel. If trodden upon, it immediately strikes with great force, and Pennant says, "we have seen it direct its blows with as much judgment as a fighting-cock." The wounds it inflicts cause great pain and inflammation, whence it has obtained the vulgar name of "sting-fish." The best remedy is to rub in equal parts of tincture of opium and olive-oil. Hot water also relieves the anguish.

In reference to the tenacity of life in this genus, Mr. Yarrell makes the following interesting observations, bearing upon fish generally :—"It may be considered as a law that those fish which swim near the surface of the water have a high standard of respiration, a low degree of muscular irritability, great necessity for oxygen, die soon—almost immediately when taken out of water, and have flesh prone to rapid decomposition. On the contrary, those fish that live near the bottom of the water have a low standard of respiration, a high degree of muscular irritability, and less necessity for oxygen ; they sustain life long after they are taken out of the water, and their flesh remains good for several days."

Every one may have noticed that carp, tench, and the various kinds of flat fish and the eel, are seen gasping and writhing for hours after they have left the water, while the mackerel, salmon, and herring are no sooner caught than they cease to respire. It is a well-known fact that "deep-water fish" are firmer to the touch, and will remain fresh longer than those taken from shallow water.

Of the next genus (*Mullus*), two species only are visitors of our shores ; the *Red* and the *Striped Surmullet ;* the former being extremely rare. These fish were well known to the ancients, and the generic term by which they are distinguished is said to have reference to the scarlet colour of the sandal or shoe worn by the Roman consuls, and in later times by the emperors, which was called *mullus*. One species was greatly celebrated for the excellence of its flesh and its extreme beauty, and the most extravagant prices were given for it. The epicures in the days of the poet Horace, valued it in proportion to the size, because of the difficulty of procuring large ones; and the sum given for one in the time of Juvenal and Pliny, is a striking proof of the luxury and extravagance of the age. Juvenal says,—



RED MULLET.

> "Six scanty pounds the mullet weigh'd
> Six thousand sesterces the wise man paid!"

These fish stand pre-eminent in the annals of human luxury, cruelty, and folly, and in connexion with them the Roman epicures have secured to themselves the everlasting reprobation they richly merit. They put these beautiful creatures into glass vessels filled with water, over a slow fire upon their tables, and then watched the various changes of their rich colours, as they lay expiring in agony, preparing for their pampered appetites.

The *Striped Surmullet* is of frequent occurrence on our southern coast. It is migratory, but yet may be procured of the London fishmongers throughout the year, though much more plentiful in May and June, when its colours are most vivid, and the fish in finest order. The scales are easily rubbed off, so that those seen in the fish shops are rarely good specimens, the skin being crimson with extravasated blood, all the scales having been detached from the body by the working of the tram-nets, in which they are captured. The average size is from twelve to fifteen inches in length. Sometimes they are caught in great profusion, and at others are very scarce. In August, 1819, 5000 were taken in one night, in Weymouth Bay. The flesh is firm and of good flavour, somewhat resembling the meat of the lobster, and is reckoned easy of digestion. At the present time, the Mullets of Provence and Toulon are in high estimation. These fish are destitute of an air-bladder. Their food appears to be selected from among the crustaceous and molluscous animals; and in connexion with this subject, we must not forget to mention, that they are furnished with two long barbules or feelers, hanging from the under jaw; appendages not uncommon in other fishes. These *cirri*, as they are called, appear to be delicate organs of touch, by which the species provided with them, and which are known mostly to feed near the bottom, are enabled to ascertain to a certain extent, the qualities of the various substances with which they come in contact; and they may be regarded as analogous to the peculiar beaks of the wading birds, which probe for food beyond their sight. Here is another instance among the many beautiful provisions of the Father of mercies for the well-being and sustenance of His creatures.

"All thy works praise thee, O Lord."

As a pleasing conclusion to this chapter, I wish to point the attention of my readers to the subject of Vivaria, already referred to.* In a paper read by Mr. Andrews before the Dublin Natural History Society, January 7th, 1854, we find some very interesting "Remarks on Harbour Fish, and on the Formation of Piscinæ," relating principally to the smaller kinds, chiefly marine,—which would form suitable objects of investigation, if placed in those large tanks with shingly and sandy beds, and with rock-work covered with sea plants and confervæ, to suit their habits and tastes.

Mr. Andrews went through the classification of the several genera of our marine fish, remarking, that among the family of Perches, the Great and Lesser

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* See Introductory Chapter, p. 23.

Weever deserve notice: the latter especially noted for its stinging power, and also its activity in self-defence. It is a pretty fish, streaked with brown and yellow, and with a silvery abdomen; having its eyes fixed upwards like the Gobies. Of the same family, the Striped Surmullet is of most remarkable beauty in its living state; its scales of a brilliant red, passing into a silvery pink on the belly. In confinement, it moves timidly about, waving its barbels to and fro, as organs of touch. The Basse, like several of our marine fishes, thrives well, kept permanently in fresh-water.

Under the head of the Mailed Cheeks, or Gurnard family, are the several species of bull-heads, which are most amusing when captured. Some give a slight hissing sound, and make their formidable spines very prominent, by the inflation of the head. Nothing can surpass the extreme beauty of the Greenland bull-heads; the richest tints of carmine and deep maroon, with spots and bars of the most vivid brilliancy, characterise this beautiful fish in the living state. The ova or roe, is of a fine scarlet; the natives of Greenland are fond of this fish, and even eat the roe in a raw state.

Of the Sticklebacks, the ten and fifteen-spined frequent the harbours; when placed in a tub of water, their playfulness and agility attract attention. Except when excited or alarmed they do not show their spines, which remain closely pressed against the dorsal ridge. They eagerly seek and attack their prey among the tangled masses of confervæ, amid which also they form their nests and deposit their eggs. They readily seize the food offered them, almost immediately after capture.

Passing over many species and families which are wholly deep-water fish, we next come to the riband-shaped form; among which is the beautiful red-band fish, which assumes the richest carmine, to a pale rose tint. It is not often taken; but in low spring-tides it may be occasionally seen among the sea-weed. It would form a beautiful object in one of the crystal cisterns, with its sinuously gliding motions, between the stems of sea-plants—its eyes, large in proportion to its head, directed in pursuit of the soft molluscous animals on which it feeds.

The Mullets are among the most lively and playful fish; the grey attains large size, and every water seems suited to its growth; salt, brackish, and fresh; it is easily fed, too. The Atherine, or Sea-smelt, may be found in sandy inlets, during the winter and spring months, at which time it is in excellent condition for the table.

Among the Gobies, a great many pretty species are found, of which the Blennies are remarkable. There is also the spotted Gunnell, called the butter-fish, from the unctuous feel of its body. It bears every tint of rich brown, yellow, and purple, and the large dark spots, in some specimens, are very conspicuous along the line of the dorsal fin. The Black Goby is beautiful in the spawning season, with the deeper shades it assumes, and the rich orange tints of its fins. This species, and the Shanny, are observed carefully to protect their numerous young. The Shanny occasionally are seen to rise to the surface perpendicularly with the aid of the pectoral fins, and by the same means appear singularly to raise themselves, or creep up the surface of any perpendicular rock or stone.

Of the Dragonets, the Gemmeous is beautiful in the living state, richly marked, and the transparent beauty of its dorsal fins is singularly delicate. It is only obtainable in the trawl, in deep water.

The family of the Wrasses vie with all the rest in the brilliancy and gaudiness of their colours; the three-spotted is of the most bright rose and reddish-orange tints. Also, the Goldsinny is an extremely handsome fish. This class of fishes would be most attractive in a vivarium, and none could be more easily fed, living, as they do, upon crustacea and the harder molluscæ, which their jaws, armed with strong conical teeth, enable them to crush.

Multitudes of others might be mentioned; as the several species of Motella, the lemon and variegated Soles, the Suckers, and all the known British species of the Pipe fishes; some are beautifully and vividly marked, and their singular marsupial habits would render the observance of their manners particularly interesting. But we have no space to add more. Sufficient has been said to awaken the interest of the young naturalist; and with a dredge and a small boat-net, he may capture for himself many of the species enumerated. To follow out diligently the necessary researches by daily examination of the habits of these different fish, would afford much pleasure, and probably lead to the discovery of many new and interesting facts concerning a department of natural history, as yet but imperfectly known. Such industry will infallibly prove its own reward; for he will find, at each step of his progress, fresh light breaking in upon him, and new and unexpected fields of investigation laid open to his delighted contemplation.

Incredible are the number and variety of the finny inhabitants of the waters, with all their curious forms, grotesque appearances, and varied colourings, in bright and beautiful contrast—

> "Strange forms, resplendent colours, kinds unnumbered,
> With swords, saws, spiral horns, or hooked fangs."

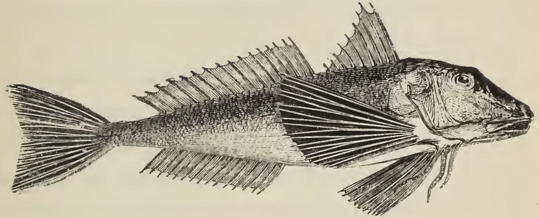
CHAPTER II.

FAMILY OF MAILED CHEEKS.

M. Cuvier's second family of the first order, contains those genera, the species of which have their cheeks defended by hard plates, which are sometimes spinous. It is very numerous, comprising about one hundred and seventy species, not one-fifth of which is European. In general conformation, the fishes composing it are not very different from the Perches; but the singular appearance of their head, which is variously armed with spines and bristles, forms a striking distinction.

Of the first genus (Trigla), the *Gurnards,* there are six British species, three common, the others more rare. The English name, agreeing with the French, is derived from the growling or grunting noise they make, by means of their gills and throat, when playing on the waves, and still more frequently when newly caught. They are all marine fish, and frequent deep waters. Few fishes have the head so well defended as the Gurnard. They are also furnished with three free rays at the base of the pectoral fin, which are abundantly supplied with nerves, and aid the fish, as organs of touch, to find its food at the bottom. These rays also serve another purpose, as is apparent in the following account given by M. Deslongchamps, in the Transactions of the Linnean Society of Normandy, in some "Observations on the ambulatory movements of the Gurnard at the bottom of the Sea." In 1839 he had an opportunity of observing these movements in one of the artificial sea-ponds on the shore of Normandy. He saw a score of Gurnards, closing their fins against their sides, like the wings of a fly in repose, and, without any movement of their tails, walking along the bottom by means of the six free rays, three on each pectoral fin, which they placed successively on the ground. They moved rapidly forwards, backwards, to the right and left, groping in all directions with these rays, as if in search of small crabs. Their large heads and bodies seemed scarcely to throw any weight on these slender rays or feet, being suspended in water, and further supported by their air-bladder. During these movements, the Gurnards resembled insects moving along the sand.

The *Red* or *Cuckoo Gurnard* is very abundant on the southern and western coasts. The appellation given it is bestowed from the supposed resemblance of its note to the bird; it is also frequently called "the soldier," from its bright red colour. Its flesh, like that of its congeners, is palatable, though somewhat dry. In the north of Europe, it is salted for preservation.



RED GURNARD.

The large size of the pectoral fins, and their fine blue colour on the inner surface, probably suggested the name of the *Sapphirine Gurnard*, which is the most valuable of the species. In addition to its being equal to the others for food, it is much more abundant and larger, occasionally measuring two feet in length. It is sometimes called a Tub-fish.

Equally common with the Sapphirine, is the *Grey Gurnard.* It is generally of a grey or brownish-grey colour, and about a foot or sixteen inches long. It is so common on the Cornish coasts, as to be considered a pest by the fishermen. It takes the bait greedily in deep water, and will bite at a red rag; and is fond of sporting on the surface. In fact, the whole of the Gurnards take a bait readily, and feed on almost anything, though their favourite food is small crustacea. Their habits are wandering, hence they are sometimes much more abundant than at others.

The three remaining species, the *Piper*, the *Streaked Gurnard*, and *Block's Gurnard*, are more rarely found on the British coasts.

We come next to the *Bullheads* (genus Cottus), of which there are four British species; one fresh, the other three salt-water fishes. They derive their name from the large size of the head—as we use the words bull-finch, bull-frog, bull-rush, &c., to indicate species of unusual size.

The *River Bullhead*, or "Miller's Thumb," is a small dark-coloured fish, four or five inches in length, familiarly known in most of the streams of Europe. It is generally found among loose stones, under

RIVER BULLHEAD.

which, from the flattened form of its head, it is enabled to thrust itself; it darts from these places with great rapidity upon its prey, which are insects or larvæ.* The flesh has a reddish hue when boiled, and affords a wholesome food to the poor inhabitants of some countries; but it is said, that in Russia no one will touch it, the common people using it only as a charm against fever, or suspending it as a weather indicator.

The salt-water species have a general aspect very repellent, and even hideous; which has procured the luckless creatures many opprobrious names. Their broad, low heads, armed with formidable spines, their wide gaping mouths, and disagreeable colours, are certainly forbidding; and hence they have been called sea-scorpions, toads, devils, and father-lashers, "as if," says M. Cuvier, "traits so hideous indicated atrocious vices." They are common in the Northern Seas, and in many respects the three species resemble each other. Their size is not great, a foot in length exceeding the average.

The *Sea Scorpion*, or *Short-spined Cottus*, is very common on our shores, and almost every haul of a net is sure to produce examples of this species of the father-lasher. They are of no use, and being dangerous to handle, because of their numerous spines, are flung back into the water. In the pools left above low-water mark they frequently remain imprisoned, and fall into the hands of the young urchins who haunt the shore, and who torture these unhappy fish just as the bird-nesting boys persecute the harmless yellow-hammer.

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* It lives generally at the bottom and deposits its spawn in a hollow it forms in the gravel, which it quits with reluctance, and defends its young.

The *Father-lasher* is immediately recognised by its long spines and well-armed head. Here, it seldom exceeds eight or ten inches in length; but in Greenland it attains a much larger size, and forms a favourite food of the natives, the soup made of it being both pleasant and nutritious, "so that," says David Crantz, "the sick may eat it;" in fact, this admirable author assures us that, next to the Augmarsit (a small herring), the Greenlanders eat most of this "toad-fish," for all it has "a very ugly look." *

The *Four-horned Cottus*, is rare, having been recently added to the list of British fishes by Dr. J. E. Gray, of the British Museum. It has been taken on the north-east coast of England, and occasionally is sold in the London market. It is distinguished by four rough hornlets on the top of the head, whence its name.

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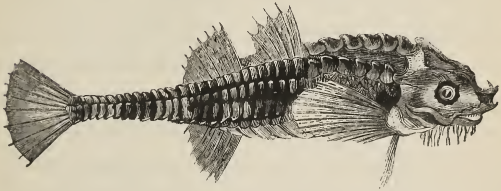
* The gills in this species are very large, and yet this fish lives for a long time out of water, the general rule being supposed to be that the power of sustaining life after removal from that element depends on the smallness of such apertures. This rule is, however, by no means universally applicable; and the true cause of death in a fish taken out of water, seems to be suffocation. All fish breathe by means of their gills. The little red slips we see forming the gills contain blood-vessels, and the blood becomes aerated by means of these, so to speak, lungs being waved backwards and forwards in the water. When the supply of water is removed, the gills become stuck together, and of course cannot act; the breathing apparatus is clogged up, and the fish dies for want of air. See "Curiosities of Natural History," by F. T. Buckland, p. 249.

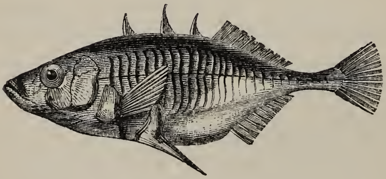
The *Armed Bullhead*, or *Pogge*, is a distinct genus. It cannot easily be mistaken for any other, its chin being supplied with a beard of numerous thread-like filaments, and it has singularly recurved spines on its snout. It is not uncommon on many parts of the coast, and feeds on aquatic insects and crustacea.



ARMED BULLHEAD.

The last British genus of this family (*Gasterosteus*) includes the well-known Sticklebacks, which are both the smallest of our fresh-water fish and among the most common. They have many popular names, referring to the armour which defends them; their backs, ventral fins, and other parts being furnished with spines, by the aid of which they protect themselves against the assaults of other fish, and know exceedingly well how to take their own parts in various ways. These active and greedy little fish are extremely destructive to the fry of other species; hence they are very injurious in fish-ponds, from which it is no easy matter to extirpate them. In proof of this, we are told they spring more than a foot perpendicularly out of the water, and to a much greater distance in an oblique direction, when desirous of overcoming any obstacle. It is almost incredible the quantity of small fish they will devour. No fewer than seven species are enumerated among our British fauna; of which

The *Three-spined* or *Rough-tailed Stickleback* is one of the largest and most powerful, ranging from two to three inches. This is the common Stickleback of our rivers. His strength, courage, capacity for enduring different temperatures, and pugnacity, together with his extraordinary attachment to his young, make him, notwithstanding his comparatively diminutive size, quite a king among fishes.



ROUGH-TAILED STICKLEBACK.

As has before been said, none of our naturalists have described the nidification of this species. M. Coste, in 1847, read a paper in the French Academy, in which he entered fully into the subject; and the following account is the result of his interesting discoveries:—"At spawning-time, the males (for these are the builders, the females remaining perfectly passive) may be seen busily employed preparing the nests. Every bit of the material is brought in the tiny mouth of the fish, often from considerable distances. His various contrivances to prevent the foundation of his structure from being carried away by the stream, are exceedingly interesting; the most common being the deposit, on the lighter materials, of a layer of sand, which he also fetches in his mouth. The floor thus formed is cemented by means of a gluten, which he obtains from his own skin, by continuous rubbing, an operation from which he evidently suffers great fatigue. His next process is to attach a row of small uprights, or twig columns, to this base; in the performance of which he exhibits the most fastidious delicacy of taste, taking them out over and over again, and fixing them in a position more to his mind. Sometimes he may find a part of the materials unsuitable; in which case he removes them, and carries the useless stuff to a distance, so as not to encumber his future proceedings. As the walls rise, he cements them as he had previously done the base, and then completes the roof in a similar manner. The nest, when finished, has two entrances, which he preserves in the desired form, by passing in and out, in opposite directions, so as to keep them sufficiently open."

The facts thus recorded differ, in some respects, from what has been observed in the nidification of the Three-spined Stickleback, and probably may refer to another species. What I have to relate has reference to two species, the Three-spined and the Ten-spined Sticklebacks, and occurred under the notice of the curator of the Norwich Museum, in 1857.

Two glass troughs, filled with aquatic plants and animals, were provided, into which a solitary individual of either species was inducted. Each made himself quite at ease; and a female companion being introduced into the domicile, he was not long in commencing the work of nidification.

The appearance of the *Three-spined Stickleback* was exceedingly beautiful. The little creature's throat and belly were of a bright red colour, and his eyes of a brilliant bluish-green, having a perfectly metallic lustre, not unlike the green feathers of a humming-bird; and the whole fish seemed somewhat translucent, and glowing with an internal brightness. He selected a spot nearly in the centre of the trough, and busily set to work to make a collection of delicate fibrous materials, resting on the ground, and matted into an irregularly circular mass, somewhat depressed, and upwards of an inch in diameter, the top being covered with similar materials, and having in the centre a rather large hole. His work was commenced at noonday, and was completed, and the eggs deposited, by half-past six in the afternoon. Nothing could exceed the attention from this time evinced by the male fish. He kept constant watch over the nest, every now and then shaking up the materials, and dragging out the eggs, and then pushing them into their receptacle again, and tucking them up with his snout, arranging the whole to his mind, and again and again adjusting it, until he was satisfied; after which he hung or hovered over the surface of the nest, his head close to the orifice, the body inclined upwards, at an angle of about 45°, fanning it with the pectoral fins, aided by a side motion of the tail. This curious manœuvre was apparently for the purpose of ventilating the spawn; at least, by this means a current of water was made to set in towards the nest, as was evident by the agitation of particles of matter attached to it. This fanning or ventilation was frequently repeated every day till the young were hatched; and sometimes the little fellow would dive head foremost into his nursery, and bring out a mouthful of sand, which he would carry to some distance and discharge with a puff.

At the end of a month, the young ones were first perceived.*

Unremitting as had been the attention of this exemplary parent up to the time of the hatching of the eggs, he now redoubled his assiduity. He never left the spot either by night or by day; and during the daytime he guarded it most pertinaciously, allowing nothing to approach. If any of the water-animals chanced to come near, he would instantly pounce upon them, and unceremoniously shove or tumble them over. If a stick or quill were passed down from the top of the vessel, he struck it fiercely, and with such smartness, that the blow was distinctly felt by the hand.

The fry were at first so minute and transparent, that they were scarcely perceptible, and it was only by a slight fluttering motion their position could be occasionally discovered; otherwise it was impossible to detect them. They were for a time confined to the meshes of the nest, and its near neighbourhood, but by degrees were allowed greater space; and the parent fish hollowed out a sort of small basin for them, in which they disported themselves, until they were strong enough to take a wider range.

In consequence of there being no other fish in the vessel, we did not see the battles and stratagems which are carried on between companion and rival fishes, when engaged in similar parental duties. The encounters on such occasions are said to be fearful and prolonged, and it is not without reason the young nestlings are so carefully guarded, as acts of cannibalism are not unfrequent; it being, alas! too true, that they greedily devour each other's spawn.

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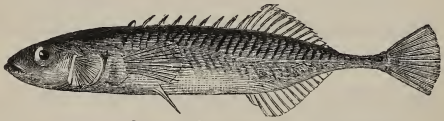
* The nest was built on the 23d April: the young appeared first, May 21.

A most curious and deeply interesting fact is related by Mr. Hancock (in the Transactions of the Tyneside Naturalists' Field Club), with reference to this subject. One of these newly-hatched fishlings was observed to venture beyond the limits of his cradle, when, in an instant, the watchful parent was seen to seize the straggler, which disappeared inside his jaws, and was enclosed within them. Here was a puzzle! The affectionate solicitude of the parent had ended in devouring his own offspring! But no; the old fish, quietly returning, dropped the straggler into its nest lively and uninjured. This was seen repeatedly to happen. When any of the young attempted to exceed the boundary limits—and many did so—they were immediately seized and brought back in the mouth of the parent.

On one occasion, Mr. Hancock took a young one out to examine it, and when returned to the trough, it was so sickly, that it could with difficulty leave the vessel in which he held it. The old fish, perceiving the helpless condition of its offspring, came up to the surface of the water, and carried the young one almost out of his very fingers, and, taking it to some distance, puffed it out into a tuft of confervæ.

After relating these particulars concerning this courageous and ever-vigilant little fish, there is, perhaps, no need to say that the Three-spined Stickleback is scarcely, if at all, inferior to the hen, that well-known model of parental care and love.

The *Ten-spined Stickleback*—the other species referred to—is one of the smallest of the fishes that occur on our coast, as well as many of our rivers, up which they are said to migrate in shoals, in the spring. It is from an inch and a half to two inches in size, and is distinguished from all the rest by having nine or ten spines on the back, and by the sides being perfectly smooth, without any lateral plates. The process of nidification in this case was different from the former. The nest was made by weaving or intertwining the small water-plants or grasses at the sides of the trough, so as to make a sort of receptacle for the spawn. The fish was much



TEN-SPINED STICKLEBACK.

less active and spirited in its movements, took longer about the construction of its nest, and the young were slower in hatching.

The *Fifteen-spined Stickleback* is a marine species, and will at once be recognised by the most casual observer, by its many spines, prolonged tail, and elongated snout, the under jaw projecting. It is sometimes named the Sea Adder, from its snake-like appearance. The nest was first noticed by Mr. Couch, on the Cornish coast, 1842, and has since been observed by other naturalists. It is composed of pendant sea-weeds, bound together by a silk-like thread, into pear-shaped masses, in the centre of which the spawn is deposited. One of these nests was visited every day for three weeks by Mr. Couch, and the old fish was invariably found guarding it. When any part of the nest was removed, the creature immediately set about repairing the damage, by drawing together the sides of the opening, so as again to conceal the eggs, which had been exposed to view. As great force was necessary to effect this, the fish would thrust its snout into the nest, as far as the eyes, and then jerk backwards, till its object was effected. While thus engaged, it would suffer itself to be taken in the hand, but repelled any attack made on the nest.

The *Half-armed*, *Smooth-tailed*, *Short-spined*, and the *Ten-spined Sticklebacks* are the remaining British species. They are very similar in appearance, and probably in habits, to their brethren.

It has already been observed, in speaking of the varying colours of fishes, that the Sticklebacks are among the most remarkable examples of this peculiarity.

CHAPTER III.

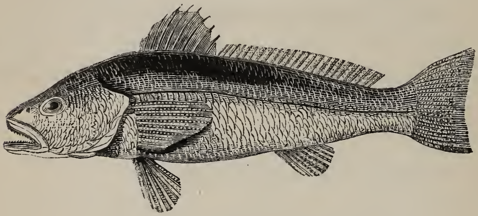
FAMILIES OF THE MAIGRES, THE SEA BREAM, AND THE MACKEREL.

> "O Sea, old Sea! who yet knows half
> Of thy wonders and thy pride?
>
> . . . .
>
> "The tusky mouth, and the spiny fin,
> Speckled and warted back;
> The glittering swift, and flabby slow,
> Ramp through this deep sea track."

We come next to the great *Family of the Maigres* (Scienidæ), whose ascertained species amount to about 260, one of which only is fully recognised as having a place among the fish of Britain, and it has not been observed in more than five or six instances. This is—

The *Maigre*, the best known, largest, and most remarkable genus in the European seas, and familiarly known on the coasts of Italy. It acquires a great size, reaching from three to six feet, with proportionate bulk, and has a strong general resemblance to the perches; but differs from them in having the tongue and the roof of the mouth quite smooth. It has always been celebrated for the goodness of its flesh, and the head was an Epicurean dainty with the

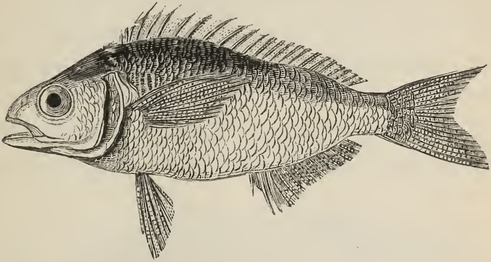
Romans. It is a very powerful fish, and when taken, struggles so violently as to endanger the safety of the fishermen. It swims in shoals, and utters a grunting or purring noise, which may be heard to the depth of twenty fathoms. The colour of the body is a uniform greyish silver, and the back brownish. In the Mediterranean, as they move about, they are said to present the brilliancy of gold and silver, and to shine with all the colours of the rainbow.



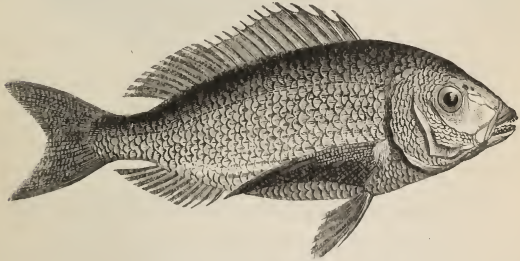
MAIGRE.

The next family, that of the *Sea Bream* (Sparidæ), which has a general resemblance to the preceding, contains about 150 species, the majority of which, as of most of the other spinous finned families, belong to the southern seas. Of British species there are but seven, and of these, only one is at all common. It is—

The *Sea Bream*, a common fish in the Mediterranean, and by no means uncommon on many parts of our European and western coasts. Off Hastings and Weymouth it is abundant. It is also the most brilliant of the Breams, and it is readily distinguished by a large dark spot on the shoulder. Its colour is flesh-red, with golden yellow reflections; the usual size is from sixteen to twenty inches. It is most abundant in summer, when the young approach the shore in multitudes, and, as they readily seize a bait, they are taken by anglers from the rocks. In the immature state they are called "chads," and are with-



SEA BREAM.

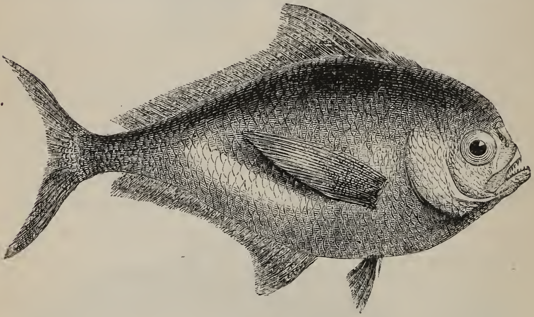


BRAIZE, OR BECKER.

out the dark spot on the side. This fish is in low estimation as an article of food.

The *Braize*, or *Becker* is of a bright and beautiful red colour, and is said, by Mr. Couch, to be not uncommon on the Cornish coasts, in summer and autumn, though never abundant, and the young are rarely seen.

The other species, the *Gilt-head*, *Spanish Bream;* the *Toothed Gilt-head*, the *Black Bream;* and *Ray's Bream*, are all more or less rare; to which may be added, the *Pomeranian Bream.*

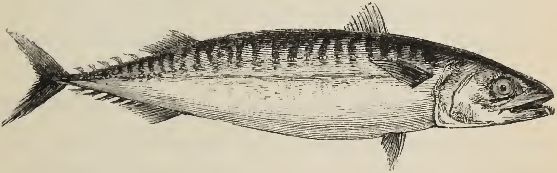


RAY'S BREAM.

The *Mackerel Family* is one of the most useful to man, many of the species constituting excellent food, their size being considerable, and their numbers enormous. These are among the most numerous of the Osseous fishes, after the perches, the described species amounting to upwards of 320. Many of them crowd the surface of the ocean, especially in warm latitudes, and their range is most extensive.

Although comparatively few species are British,* yet the multitude of those which appear on our shores is innumerable, and they are remarkable for the brilliancy of their colouring, elegance of their shape, and the rapidity of their movements.

The *Common Mackerel* may be taken as the perfection of the class. This is the most elegantly beautiful of our native fish. It is in season earlier than the herring, usually appearing in spring, and the fishing is carried on in May and June, as in the latter month it spawns.



MACKEREL.

> "When buxom Spring's luxuriant airs inspire
> The softer wish, and blow the genial fire,
> The Mackerel, rushing from the Atlantic deep,
> In midland seas with us their nuptials keep."

So sings the ancient poet of the fish—Oppian.

In common with some other of our gregarious fishes, this was formerly supposed to be a fish of passage, performing, like some birds, certain periodical migrations, and making long voyages from north to south, at one season of the year, and the reverse at another. This opinion is now admitted to be erroneous; it is known that these fish are taken, even on our own shores, in every month of the year; and it is generally believed that they are, at no season, more than a few miles distant from the coast, but that, on the approach of warm weather, they are compelled, by a common impulse, to visit the shallow waters, in order to deposit their spawn. And this is evidently one of those wise and benevolent provisions of the Creator, by which, not only the species is perpetuated with greater certainty, but also these tribes are thus brought periodically within the reach of man, precisely at the time when they are in the highest condition, and afford the most wholesome and palatable food. This grand business of life accomplished, the swarming multitudes retire,—not to the Arctic Seas; but to the deep water of the offing, where they again rove in freedom and security.

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* They are the Mackerel, the Spanish Mackerel, Tunny, Bonito, Sword-fish, Pilot-fish, Scad, Black-fish, Dory, Boar-fish, and Opah, or King-fish.

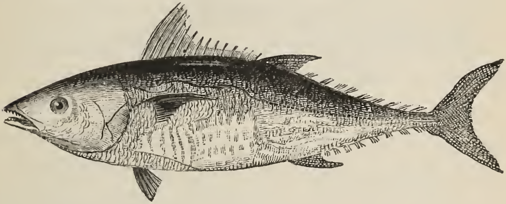
This fish is taken in most abundance in the southern parts of the kingdom, the coasts of Kent and Sussex being the chief stations of the fishery. The various fishing towns present a most lively scene of bustle and activity at the mackerel season; the frequent departures and arrivals of the boats at this time, affording a striking contrast to the ordinary dull routine in such places. The high prices obtained for the early cargoes, and the large return occasionally gained from the capture of a single night, are inducements to great exertions.

There are three different modes of fishing for mackerel. The first and commonest, is by drift-nets, which are set in deepish waters, so as to arrest the fish while roving about during the night. The second mode is by the seine, a long, deep net, by which the shoal is encircled and enclosed; this is used sometimes in deep water, and sometimes near the shore. A third mode is fishing with the hook, trailing the line near the surface. This last method is well described in the "Wild Sports of the West."—"It was evident the bay was full of mackerel. In every direction, and as far as the eye could reach, gulls and puffins were collected; and to judge by their activity and clamour, there appeared ample employment for them among the fry beneath. We immediately bore away for the place where these birds were most numerously congregated; and the lines were scarcely overboard, when we found ourselves in the midst of a shoal of mackerel. Directed by the birds, we followed the fish, tacking, or wearing the boat occasionally, when we found we had overrun the shoal. For two hours we took these beautiful fish, as fast as the baits could be renewed and the lines hauled in; and when we left off fishing, we found we had taken above 500 lbs.

"Everything about this sport is most animated and exhilarating; a brisk breeze, a fair sky, the boat in quick and constant motion, all is life and bustle. He who has experienced the delightful sensation of sailing on the western ocean; a bright autumnal sky above, a deep green lucid swell around, with a steady breeze, will estimate the exquisite enjoyment our morning's mackerel fishing afforded."

The value of this fish depends in a more than common degree on its freshness; and hence it is important, that no time be lost in conveying it to market. Fast sailing boats are, therefore, kept in readiness to convey the cargoes to London as soon as caught, and the aid of steam is secured in ascending the river; for the loss of a single tide may diminish the value of the cargo one half, or even render it worthless. During the season, not less than 100,000 are thus taken to Billingsgate weekly.

The Mackerel is a fish of very rapid growth. The ordinary length is from fourteen to sixteen inches, and the weight under two pounds each. Some attain much greater size, but the largest fish are not considered the best for the table. The young are called "shiners," and breed in the second season. Mr. Couch says, "No two mackerel are alike; but the fishermen detect a difference which none but a practised eye can discover. On this point I was, for a time, sceptical; but am now brought over to their way of thinking, and can detect the differences as readily as themselves." How curious and interesting is this individuality of living beings; so that it seems the general law that every creature has its own separate mark, set upon it (so to speak) by its great Creator!*



TUNNY.

The *Tunny* is a fish of renown. Though only an occasional visitor of our shores, it is as important an object of pursuit in the Mediterranean as the mackerel and herring among ourselves, or the cod at Newfoundland; and from time immemorial prodigious numbers have been recorded as frequenting that sea. It was known to Aristotle, and its goodness, as well as beauty, have always made it an object of eager pursuit. The fishing is of great antiquity as well as value.

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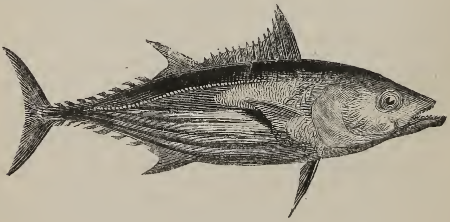
* There is a small sized species of mackerel, called the *Spanish Mackerel*, which is occasionally seen on the Cornish coast. It is very similar to the common mackerel, but is not so elegant in shape or markings. It is in no esteem for food.

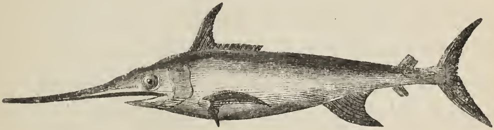
The Tunny seems to have been more frequently observed on the Scottish than on the English coasts. Mr. Pennant says:—"They frequent our coasts, though not in shoals as in the Mediterranean, and are not uncommon in the lochs of the west of Scotland, where they come in pursuit of the herrings, and often, during the night, strike into the nets, and do considerable damage." He adds that he saw one at Inverary, in 1769, which measured seven feet ten inches long; and it is recorded to have been taken still larger in the Mediterranean. In form it is similar to the mackerel, but is larger, rounder, and has a shorter snout. The flesh of the tunny is of fine flavour, and is so solid as to seem something between fish and meat.



BONITO.

Very similar to the Tunny in form, but much smaller, is the *Bonito*. It is one of those species so well known within the tropics for the amusement they afford by their pursuit of the flying-fish. Stragglers are occasionally met with in our seas.

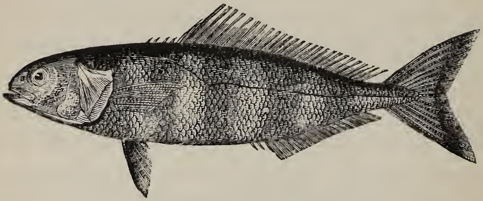
The *Sword-Fish*, inhabiting almost every part of the Mediterranean Sea, was well known to the ancients, who called it by various names which had reference to its weapon, its supposed powers, or its imposing appearance. The long and bony spear which projects from its snout is of most formidable appearance, and threatens everything which approaches it. It attains a large size—frequently from ten to twelve feet—and is reported to have fierce contests with the whale; and this habit attributed to the Sword-fish is confirmed by the frequency with which ships are struck with great violence,—most museums possessing fragments of ships in which the "sword" of this finny tyrant is imbedded. It is with much probability supposed that the dark and huge hull of the vessel is mistaken by the fish for the body of a whale. The only resource the great leviathian has for ridding himself of these troublesome foes is to dive to unfathomable depths, in which their feebler structure could not possibly sustain the enormous pressure.



SWORD FISH.

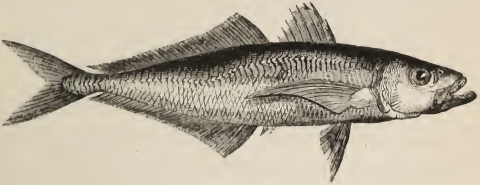
The capture of the Sword-fish, as practised from time immemorial in the Mediterranean, is a very exciting occupation, being like whale-fishing in miniature. Occasionally it is taken off various parts of the British coast. It is said to be the ordinary habit of this fish to go in pairs, male and female. In colour, all the under parts are fine silvery white; the upper parts tinged with dusky blue.

Another much-noted species of this family is the *Pilot-Fish*, which is not uncommonly seen on some parts of our southern and western shores. It is a pretty little fish, about a foot in length, and may be immediately recognised by its mackerel-like form, and conspicuous transverse bands of alternate brown and bright azure. It is supposed to have been the Pompilius of the ancients: a fish which is said to have pointed out the desired course to navigators, accompanied them throughout their voyage, and only left them when they reached the desired land. It



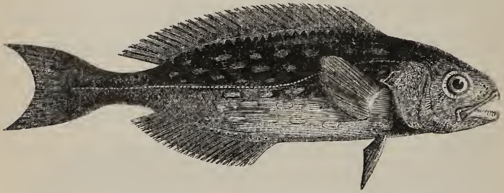
PILOT FISH.

was therefore considered sacred, and had a Greek name signifying "the Companion." Besides this habit of attending ships during their course at sea, and that for weeks and even months together, the Pilot accompanies large sharks, although it is a matter of doubt from what motives it does this,—some supposing it guides the monster to his food, while others are of opinion it is only on the look-out for the food which also attracts the shark. However this be, there is certainly sufficient evidence to prove that something very like a confiding familiarity subsists between these two very different companions of the weary mariner. Mr. Couch says, "This elegant fish is met with in Mt.'s Bay; but its presence can always be traced to the arrival of some foreign vessel, around which it constantly continues."



SCAD, OR HORSE MACKEREL.

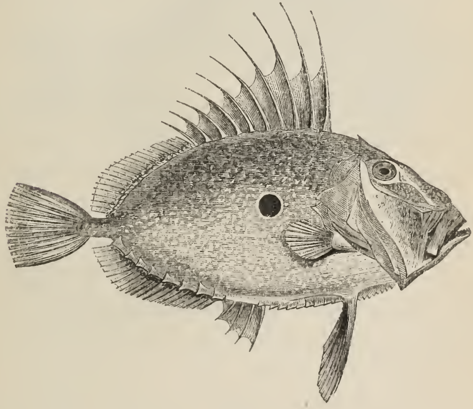
The *Scad*, or Horse-mackerel, is rather smaller in size than the common mackerel. Its name, therefore, is not derived from its size, but from the supposed coarseness of its flesh. It is occasionally abundant on various parts of the English coasts, particularly Cornwall and Devon. The usual habit of this fish is to keep near the ground; but when they are in shoals, and pursuing some favourite food, they sometimes become so eager as to thrust each other in heaps on the land.



BLACK FISH.

The *Black Fish*, an inhabitant of the Mediterranean, has been only four or five times seen on our coast. The colour is wholly black; the fins intensely so; the abdomen being somewhat lighter.

Who has not heard of the *Dory*, or "John Dory," as it is called? This fish, of considerable size, grotesque form, and uncommon colours, has excited attention on almost every coast, and from ancient times. The French and English names—Dorée—allude to its yellow-golden colour. In Sicily it is called Gallo—the Cock—from the crest on its back; and in many towns of the Mediterranean it goes by the name of St. Peter's fish, because of the mark on its sides, supposed to be the print of the apostle's fingers,—an honour shared with it by the haddock, which bears similar insignia. From a like fancy the modern Greeks, it is said, are in the habit of hanging up this fish in their places of worship. The Dory is not rare on some parts of our coasts; but it is seldom seen in Scotland. Its conformation is very singular, and is better expressed by the pencil than by words.

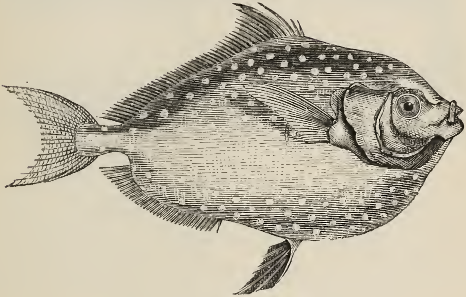


DORY.

The prevailing colour of the body is an olive brown, with yellow tinge, reflecting in different lights blue, gold, and white. When the fish is first taken out of the water these varying hues are seen in rapid succession. As a delicious luxury this fish has obtained high repute. The Dorys of the London market are chiefly supplied from the Devonshire coast. Being ground fish, they are better for being kept two or three days.

There is one habit of this fish, Mr. Couch says, well known to the hook and line fishermen. The Dory will frequently retire to the rough ground, or make a slight depression in the sand. Thus, half-hidden, the tendrils of the dorsal fin are allowed to float about like so many worms, to the temptation of all hungry passers. When a small fish—cuttle, or in fact anything—has laid hold of the tendrils, the powerful ventral fins are brought into play, up starts the fish, and opens its capacious mouth to receive the unwary victim. It also pursues its prey by a rapid succession of jerks. Six or seven pounds is the average weight of the Dory.

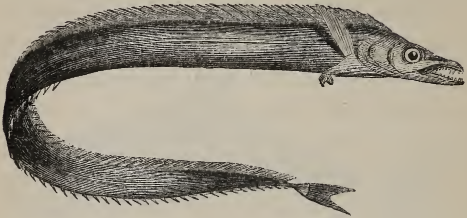
Beautiful, as rare, is the *Opah*, or King Fish. This lovely creature, once seen, can never be mistaken. Its colours are magnificent,—the upper part of a rich green, reflecting purple and gold in different lights, and a lovely rose-tint beneath. Numerous oval spots, of silvery whiteness, adorn this groundwork, and have procured for the fish the name of *Luna.* The gills are very brilliant, the large eye of a beautiful golden colour, and all the fins vermilion. No wonder that thus gorgeously adorned it should have been said to resemble a grandee of Neptune's court, arrayed in gala attire. It has been taken in the British seas, but rarely. Little or nothing is known about its habits, and it certainly may excite



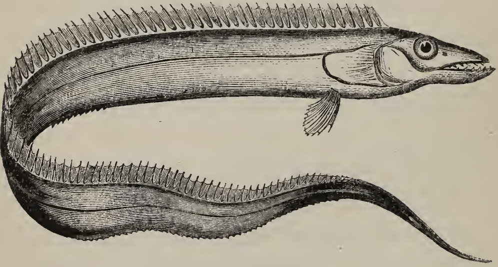
OPAH.

surprise that so large and beautiful a fish should have only recently been described. One of the specimens taken here weighed 140 lbs., and measured four feet six inches.

We come next to a family containing some of the most singular and extraordinary fishes in existence, —that of the *Riband-shaped* form (Tænioidæ); so called from their shape, which resembles that of the eel, the body indeed being not thicker than a sword, except in the middle. Covered with the richest silver, and of great length, the undulating motions of these creatures in the sea must be resplendent and beautiful beyond measure. But these wonders of the mighty ocean are almost hidden from the sight of man, since they appear to live only in the greatest depths; and it is but rarely, at long intervals, and after a succession of tempests, that a solitary individual is cast upon the shore, its delicate body torn and mutilated by the elements; in fact, a mere wreck. It is said that the Mediterranean has hitherto produced the largest number of the family, but it is distributed from the Arctic regions to the sunny shores of India, so that probably not a tithe of them has yet been discovered.

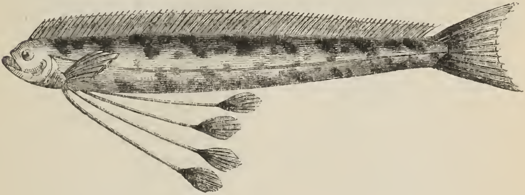


SCABBARD FISH.



SILVERY HAIRTAIL.

Not more than six species (belonging to five genera) have been obtained on the British shores, and those but rarely. They are the *Scabbard Fish*, the *Silvery Hairtail, Hawken's Gymnetrus*, and the *Red Band Fish.*



HAWKEN'S GYMNETRUS.

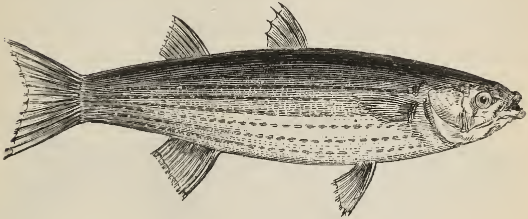
CHAPTER IV.

THE MULLET AND GOBY FAMILIES. (Mugilidæ and Gobioidæ.)

"The Mullet, when encircling seines enclose,
The fatal threads and treacherous bosom knows;
Instant, he rallies all his vigorous powers
And faithful aid of every name implores;
O'er battlement of cork up-darting flies,
And finds from air th' escape which sea denies."

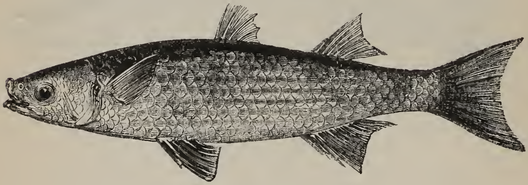
The true *Mullets* must not be confounded with the Surmullets, they being of a perfectly distinct family. The species are very numerous and valuable. They are not frequently captured in the deep sea, but are, pre-eminently, fishes of the shore, seeking shallow creeks, where, from time immemorial, they have been captured in vast quantities. They have scarcely any offensive weapons: their teeth being small and delicate, often almost imperceptible; and hence, notwithstanding their size, they can scarcely attack any other fish, though liable to the assaults of many enemies. They are, however, gifted with a remarkable instinct, which aids them in their efforts to escape danger, and which is accurately described in the lines prefixed to this chapter.

Only three species are known as British ; of which the *Grey Mullet* is the most common. Mr. Tennant says, "These fish are found in great plenty, on several of the sandy coasts of our island, and haunt, in particular, those small bays that have influxes of fresh water. They come in great shoals, and keep rooting like hogs in the sand or mud, leaving their traces in form of large round holes." The usual size of the Grey Mullet is about fifteen inches, but it sometimes reaches two feet in length. The colour of the back is steel grey, with bluish-yellow reflections. The belly is silvery white, and on the sides there are six or eight lines of a rosy brown. As to its habits, we are told it never goes very far away from land, but delights in shallow water. In the summer-time it may be seen prowling about on the muddy bottoms of rivers and harbours, with its mouth close to the ground, in search of food. It selects what is soft and fat,—is the only fish, according to Mr. Couch, which usually



GREY MULLET.

takes nothing that has life, although occasionally it may swallow the sand-worm. Instead of devouring anything, it sucks it away in fragments; hence it is very rarely taken with the hook. It ventures to some distance up rivers, returning with the tide.

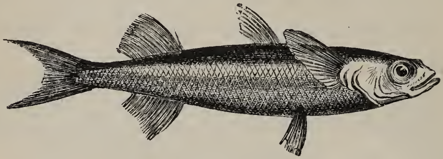


THICK-LIPPED GREY MULLET.

Both this and the *Thick-Lipped Mullet*, which is gregarious and smaller than the other, have the remarkable habit, already referred to, of escaping from confinement by leaping over the net. Mr. Couch has described very strikingly, their mode of proceeding:—"The usual way of taking the mullets is by enclosing them in a seine, and then drawing them on shore. As soon, however, as they find themselves enclosed, they seem confused, and wander from one part of the net to another, seeking a means of escape. Order is, as if by mutual consent, very soon established, and the largest of the shoal generally takes the lead in every subsequent proceeding. Thus guided, every portion of the net is carefully examined, and if a hole be found, through it they all make their escape. If unsuccessful in this, they attempt to lift the foot of the net, but the trial always fails, and many are meshed in the attempt. Baffled at all points, they retire to the centre of the space enclosed by the net, and, after a short time, the leader rises swiftly to the corks, and, followed by all the others, throws itself into the water beyond, and thus they effect their escape.

"It is an exceedingly interesting sight to see them thus make a series of efforts for a given object, adopting them in succession, as if by reason. The fishermen have had recourse to a stratagem which usually succeeds. They scatter straw along the inner margin of the buoys, and the fish, deceived by this, throw themselves over the edge of the straw; but fall, alas! into the enclosure again; and having once failed they never renew the effort. This disposition is so innate in the grey mullet, that young ones, of minute size, may be seen tumbling themselves head over tail, in their active exertions to pass the headline. I have even known one less than an inch in length, to throw itself repeatedly over the side of a cup, in which the water was an inch below the brim."

The *Atherine* or *Sand-smelt*, is a small handsome fish, from four to five inches long. It possesses a little of the cucumber smell and flavour of the true smelt, and being very pretty in appearance, from the fine broad silver stripe along the side, looks attractive on the fish-stall. It is a common fish on the southern coasts; and at Brighton is considered a delicacy, and sold in large quantities to visitors during the winter months. It is not found on the eastern shores.



ATHERINE.

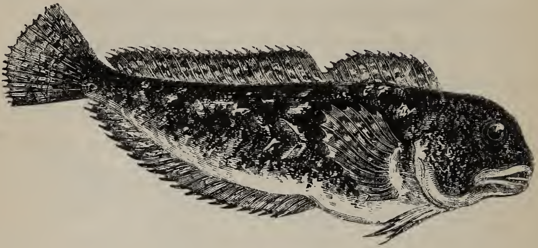
There are species of this genus in all seas, and they superabound on the French coasts, and in the Mediterranean, associating in immense troops. In some places they are in such overplus as to be given for food to the animals. Thus, in Venice, they are caught by thousands in the canals and sold about the streets as cats'-meat. What a cat's paradise must the city of the Doges be!

The Family we are about next to notice, is that of the *Gobies* (Gobioidæ), a numerous, but not economically important section. They are generally of small size, and not valued as food. The first division is that of—

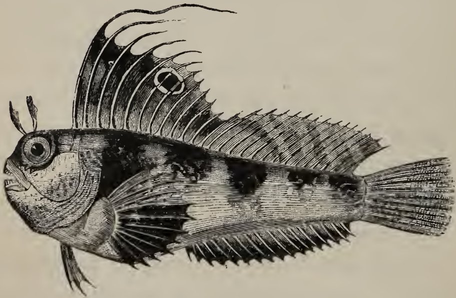
The *Blennies*, little fishes, which swim in small shoals, feeding on minute crustaceous animals, and some of them remarkably tenacious of life. They are most frequently found left by the retiring tide in small pools on the rocky parts of the coast, and are active and vigilant, hiding themselves in small crevices or under seaweed, and remaining concealed till the return of the tide. Their heads are furnished with tentaculous filaments or appendages, of different forms, and variously situated. The name Blenny is derived from a Greek word, and has reference to the unctuous secretion which covers their bodies.

The various species are pleasing inmates of the aquarium. Their health does not suffer from confinement in a narrow space; and their lively, amusing gambols, and acts of petty theft, are very entertaining. They possess a curious faculty, which was formerly attributed solely to the chameleon, the power of moving their eyes either in unison, or independent of each other; thus, they are seen glancing in one direction with one eye, while the other remains motionless, or is turned towards a different point. In fact, it is now known that Blennies, Wrasses, Suckers, and other small fish, possess this peculiarity in the powers of vision.

The *Shanny*, or *Smooth Blenny* is by no means uncommon on many parts of the coast. It rarely exceeds five inches in length, and is easily distinguished from its congeners, by having no tentacles on the head. It is very active and vivacious, and by help of its ventral fins creeps up the rocks, with great facility. It will live for nearly a day out of water, and is such an adept at concealing itself, that though so very common, specimens are procured with difficulty. It takes up its residence under a rock or stone, whence it rarely wanders far, and which yields it a safe shelter from ravenous fishes and birds. Like others of the genus, it varies much in colour according to the ground it occupies.

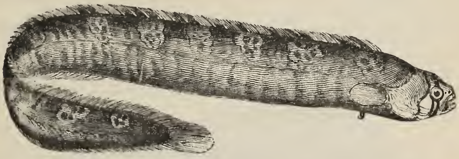


THE SHANNY, OR SMOOTH BLENNY.



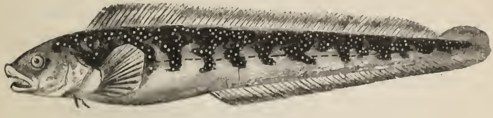
BUTTERFLY FISH.

The other species are *Montague's Blenny;* the *Ocellated Blenny;* the *Butterfly Fish*, so called from the singular appearance of its spotted dorsal fin; the *Gattoruginous Blenny*, not uncommon in Cornwall, where it is taken in crab-pots, and called by the Cornish urchins, Tompot; and the *Crested Blenny*, having on the head a small crest, which the fish can erect and depress at pleasure.



SPOTTED GUNNEL.

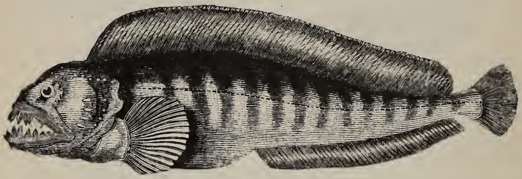
The *Spotted Gunnel*, also called the Butter-fish—from the quantity of slimy secretion which covers its sides, and is of great use in facilitating its escape from the grasp of an enemy,—is a common small fish on our coast, of similar habits to those already described.



VIVIPAROUS BLENNY.

The *Viviparous Blenny* differs from all the rest, in that it brings forth its young alive, which seem perfectly able to provide for themselves the moment they are produced. These little creatures, when very young and transparent, form excellent objects for the microscope, for viewing the circulation of the blood. The length of this species is from ten to twelve inches. Its habits resemble those of the other members of the family, and it is found on various parts of our coast, especially on the northern and eastern shores.

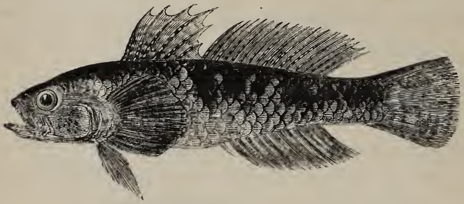
Belonging to another genus of this family, is the *Wolf Fish*, or *Sea Cat* of Scotland; a powerful and ferocious species, most abundant in the northern parts of the globe. It attains from four to six feet, and is not unfrequently met with off the coasts of Scotland and Yorkshire; its food being shell-fish, and crustacea, which it readily crushes, by means of its strong molars. The whole aspect of the fish is formidable; its round cat-like head, and fearful jaws, strike the beholder with alarm; its exceedingly thick, coarse skin is covered with slime; and its



WOLF FISH.

manners accord with its aspect. It is remarkably strong, active, and rapacious; not unfrequently it enters the nets of the fisherman to plunder them; and when attacked it fights like a lion. What a formidable apparatus is presented in the jaw-bones and teeth of a Wolf Fish! No wonder the Germans and Danes called it the "Stone-biter;" and, indeed, it fiercely bites everything presented to it, not excepting iron. Notwithstanding the ugly appearance of this fish, its flesh is said to be of very good flavour. In the northern countries it is salted and preserved, while the skin makes isinglass, cords, bags, pockets, &c.

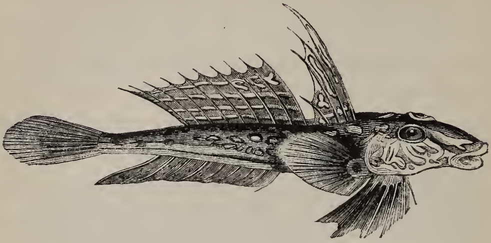
The next section of this large family contains the *Gobies* proper, or *Sea Gudgeons;* of which there are five or six species. These small fish are apparently of little value, beyond supplying food for other fishes. They are easily recognised by the peculiar form of the ventral fins, which are united together on each side, so as to form a circular funnel-shaped cavity, with which they have been supposed to attach themselves to the rocks, whence they have been called Rock Fish. They are the *Black Goby;* the *Double Spotted;* the *Speckled*, or *Spotted*, which is not only common on all our sandy shores, where it is constantly taken by the shrimpers; but is also plentiful in the Thames, where it is known by the name of Polewig, or Polly-bait. The young delight to bask in shallow pools, where, when motionless, it is impossible to detect them, their backs being precisely the colour of the sand on which they rest. They also abound on some of the shores of France, and M. d'Orbigny has often seen them in the sea pools, in the neighbourhood of Rochelle, where he has observed one establish itself under a shell, round which it would trace, in the soft mud, a number of deep ruts, in the form of diverging rays, and where it kept watch like a sentinel, waiting the minute animals which sink into these miniature ditches, and thus become its prey.



BLACK GOBY.

There are besides two or three other Gobies, very similar to the preceding species. The three kinds most suitable for the aquarium, are the One-spotted; the Two-spotted; and the Black. The last-named grows to the length of three inches, and is of the same form as the others, but its colour is dark, whence its name. It is usually of a fawn or drab tint, with dark patches, but, when excited, the colour changes to a dull indigo, with black markings. Its eyes are of a lovely blue, and sparkle like gems. It is a most voracious little creature, and when put into a tank, darts down and ensconces itself in some hole or cranny, where it lies in wait, and does not hesitate to make a meal of its spotted brethren, one of which, its own size, is speedily attacked, vanquished, and swallowed whole. These little Gobies are most engaging in their movements ; so lively and playful, darting about with swiftest motion, and soon tamed. The One-spotted is a gay little creature, scarcely two inches long : its fins beautifully transparent, and the dorsal fin having a spot of rich dark blue ; while the Two-spotted is adorned with two spots, which shine brilliantly, like the eyes of a peacock's tail.

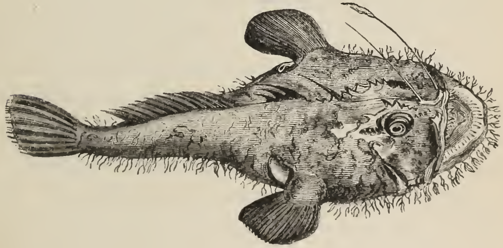
Allied to the Gobies, and classed with them, are the *Dragonets*, of which we have two species. The *Gemmeous Dragonet*, so called from its brilliant gem-like colours. The second name, Dragonet, probably originated from its large wing-like fins, and speckled appearance, which induced some naturalists to think the species allied to the flying fishes. It is a handsome fish, with a smooth skin, and having the head singularly striped with blue, on yellowish ground. When just taken, its appearance is most beautiful. The first ray of the first dorsal fin is very extraordinarily elongated, so as to suggest the resemblance to the strings of a musical instrument. Hence its classical name *Lyra.* It is not a common fish on our coasts; it frequents deep waters, and keeps close to the bottom. The length is from ten to twelve inches.



GEMMEOUS DRAGONET.

The *Sordid Dragonet* is probably so called from its dingy hues, compared with its congener, from which it is also distinguished by being shorn of the dorsal ray. It is more common, but generally of small size. Mr. Yarrell says it is often taken at the mouth of the Thames, where, from its reddish colour, it is called the Fox.

We come next to a fish belonging to a small and singular group, which M. Cuvier has denominated *Pedunculated Pectorals*, from the peculiar formation of the pectoral fins, by which some of the species can creep on land, almost like little quadrupeds. Our only British species is the famous *Fishing Frog*, or *Angler*, of ancient renown ; the fishermen of former days seeing in its habits so exact a representation of their art, that by common consent they called it the Fisher. Aristotle speaks of it as a sort of frog, which animal, in the tadpole state, it resembles, and he adds that it owed its name to the tact and industry it exercises in procuring food. The fact is, the poor fish has a most voracious appetite, and possessing small locomotive powers, as it is but a slow swimmer, it is obliged to have recourse to arts and stratagems to get its living. Pliny prettily describes one of its manœuvres thus, "It puts forth the slender horns it has beneath its eyes, enticing by that means the little fish to play around it, till they come within reach, when it springs on them." It generally frequents sandy bays, in moderately deep water, and by the aid of its hand-like pectoral fins, it forms for itself a cavity in the sand, wherein it lies.

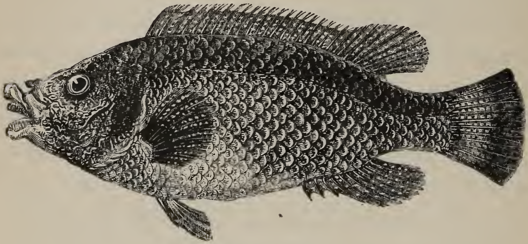


THE ANGLER.

The colour of the back is sandy, and this appearance is increased by the sand it has scooped out falling over it. Thus concealed, the long tendrils which arise from the back of its head are elevated, and their worm-like ends move gently about, so as completely to deceive any small fish passing by ; but, no sooner do they bite than up starts the Fishing Frog and devours them. Another trick sometimes had recourse to, if the soil be rough and gravelly, is this : this "artful dodger" lies at the bottom, as if dead ; and this feint is admirably assisted by the soft, semi-decomposed appearance of its flaccid, gelatinous body. In this position it remains motionless, the tendrils and filaments all scattered about *perdu.* No sooner, however, is a tendril touched than the dead man is all alive, and, if hungry, devours instantly the luckless individual ; at other times he will wait till several victims are assembled, and then take the whole in at a haul ! So great is the voracity of his appetite, that even the fierce and voracious dog-fish is not unfrequently his prey ; hence, the fishermen on the Scarborough coast, according to Mr. Pennant, have a great regard for the Angler, and whenever he is taken in their lines, set him free, because he is the enemy of these creatures, which are a pest to them.

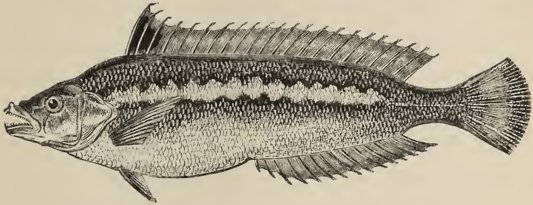
This fish is of huge, unshapely form ; the head is flat, and bigger than the whole body, and the mouth is of prodigious width, and has obtained for it the characteristic name of "wide-gape." When caught in a net, this bold and voracious animal not unfrequently takes the opportunity to devour its fellow-prisoners, which are sometimes taken from its stomach alive, especially flounders. It is found occasionally on most parts of the coast. Size, from three to five feet.

The *Family of the Wrasses* (Labridæ) is very numerous, and the arrangement of its various genera has cost naturalists no small trouble. They are liable to the greatest variations in colour, and the species have perhaps been unnecessarily multiplied in consequence. They inhabit principally the rocky parts round our coast, living much on crustaceous animals, which their strong teeth enable them to break and crush ; and spawn in spring or summer, when their colours are brightest. Their flesh is said to be soft, rather sweet, and insipid. There are several species of the first genus, the most common of which is the *Ballan Wrasse*, which attains the weight of three or four pounds, and has some resemblance to a carp in the form of the body. The Welsh call it *Gwrach*, or the Old Woman ; the French *La Vieille*, and the English give it the name of *Old Wife*. The physiognomy is certainly peculiar. The nose projects, the lips are large and fleshy, and the one turns up, and the other hangs down. The mouth can either be drawn in or protruded. The striking variations of dress to which this species is subject deserve attention. On the northern coast of France it is called the *Red* Old Woman, from the predominating red tint; elsewhere it is the *Green* when that colour prevails, and the *Yellow* when yellow is its garb. Sometimes it is of sombre olive, and then it is simply the "Old Wife." The name of "Sea-parroquet" is given to that variety in which there is a green ground, with a network of reddish hue pervading the body. Besides these, in one of the commonest species, there is a marked infusion of blue in the tinting. There is also considerable variation in the number of the dorsal and oval rays. Mr. Couch says, "Each species, though they are all rock-fish, has a particular or specific habit. Thus, in the case of the common Wrasse, the largest fish always remain the lords of their respective districts, and the smaller ones rarely intrude beyond a few feet from their



BALLAN WRASSE.

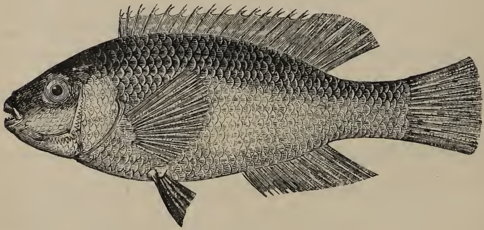
shelter. But, if the largest be caught, an abundance of small ones soon make their appearance." They are called in Scotland "Sea-swine," from the circumstance of their making a squeaking noise, like a pig. The various species are named in accordance with their differing hues. The *Green Streaked*, *Blue Striped*, *Three-Spotted*, the *Rainbow*, and one or two more. Of the last named only one specimen has been found in our seas; it is a most beautiful fish, unsurpassed for brilliancy. It inhabits the Mediterranean, frequenting the rocky shores, which are covered with marine algæ.



RAINBOW WRASSE.

"Of all the fishes which may be in the aquarium," says Mr. Hibberd, "the Wrasses are the most brilliant and engaging. Lurking under a dark stony ledge, the ancient Wrasse displays his livery of gold and green, blood-red, and olive-brown. He loves the dark cool umbrage of waving sea-weeds, among which he finds the minute morsels which constitute his innocent meal. The white under-jaw, the iridescent eye, and the rich mottled and many-coloured sides, shading into brown, crimson, and emerald green, make him a conspicuous object, as he lights up the sombre depths of the submerged forest with this vivid display of colour. His movements are solemn, and his habits quiet. The brightest coloured specimens are those of six inches long. This fish is only to be obtained of experienced fishermen. I have never known it to be taken near the shore."

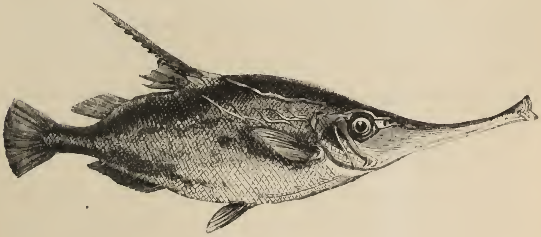
The *Gilt Head* is not an uncommon species, and is often taken in lobster and prawn-pots; as is also the *Goldsinny*, which is readily distinguished by a conspicuous black spot on each side of the tail; it is sometimes called the Corkwing, and is a minute fish, not exceeding two inches in length. It haunts the fuci, on all parts of the British coast, and may be taken with the hand sometimes, when a number of them are entangled in the weed. It is always in motion, and puts itself into very pretty attitudes, as



GILT-HEAD.

it perseveringly hunts among the sea-weeds for its insect prey.

The *Trumpet Fish*, or Sea-Snipe, is, in our British series, the last of the Spinous-rayed division of fishes. It belongs to the *Pipe-mouthed Family*, which is characterized by a long tube, formed by the prolongation of the jaw-bones, at the extremity of which is placed the mouth, which is small and without teeth. A few specimens only of this singular looking fish have been taken in our seas. It is common in the Mediterranean. The beak-like mouth must be admirably adapted for detaching minute animals from the various sorts of sea-weeds, and the form of the apparatus renders it probable that, by dilating the throat, it can suck up food, as water is drawn up through a syringe. This fish has a formidable weapon of defence in the first spine of the first dorsal fin, which is very long and powerful, pointed,



TRUMPET, OR SNIPE-FISH.

moveable, and toothed like a saw on the under part. The general colour is a golden-red hue.

While recording the various and beautiful instincts of several of the species described in this chapter, I have been often reminded of the language of one who was indeed a true naturalist, and a most devout Christian. I refer to Palissy, the celebrated "artist in earth," who, in certain treatises he has left on various subjects, occasionally makes his observations on nature, in language full of feeling, piety, and enthusiasm.

I hope my readers will admire as much as I do the following passage taken from one of his writings :—

"When visiting the shore and rocks of the ocean, I began to contemplate the industry of the various kinds of fish, to learn something of them, beginning from the largest to the least; and I found things which made me all amazed, because of the marvellous Divine Providence which had bestowed such care on these creatures; so that I perceived, in those of least esteem, that God had bestowed upon them greater industry than on the others. For, thinking to find great industry and excellent wisdom in the large fishes, I saw in them less of these—which caused me to consider that they were well enough armed, feared, and dreaded, because of their size, and that they had no need of other armour. But as for the weak, I found that God had given them industry to know how to act marvellously against the designs of their enemies.

"I perceived, also, that the battles and stratagems of the sea are without comparison, greater in the said animals than in those of the earth ; and saw that the luxury of the sea was greater than that of the earth, and that, without comparison, it produced more fruit. Hence I took occasion to glorify God in all His marvels, and what man will be so ungrateful as not to adore the Sovereign Creator in contemplating these things?"

CHAPTER V.

SECOND SUBDIVISION OF OSSEOUS FISHES.

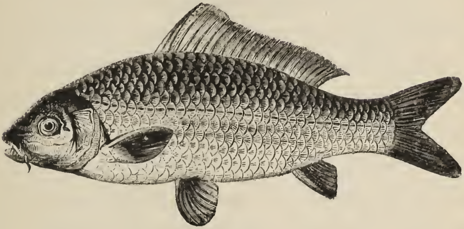
ORDER II.—SOFT-FINNED FISHES. (Malacopterygii.)

WE may now proceed to notice the next division of Osseous Fishes; those which have the fin-rays almost universally flexible. These are subdivided into three orders, according to the position or absence of the ventral fins. The first comprises those fishes which have the ventral fins situated on the belly, and unconnected with the shoulder-bones. They are the most numerous order of the section, including the majority of fresh-water fishes, a well-known tribe, pleasantly described in the following lines of Pope:—

> "Our plenteous streams a various race supply.
> The bright-eyed Perch, with fins of varied dye,
> The silver Eel, in shining volumes rolled;
> The yellow Carp, in scales bedropt with gold;
> Swift Trouts, diversified with crimson stains,
> And Pikes, the tyrants of the watery plains."

The *Family of the Carp* (Cyprinidæ) stands first, including the Carp (three species), Barbel, Gudgeon, Tench, Bream, Roach, Dace, Chub, Redeye, Bleak, Minnow, and Loach.

Few of the finny race have come more under our observation than the *Common Carp,* which has been highly esteemed, and long reared in a kind of domestic state, so that its habits are well known. The specific characters are, that the mouth has two barbules on each side, and that the caudal fin is forked. The shape is thick, and the general colour olive brown, tinged with gold. The food of the Carp is the larvæ of insects and worms, and the softer parts of aquatic plants. During the winter they eat little or nothing, and are supposed to hibernate, burying themselves in the mud. Mr. White, of Selborne, states, that in the gardens of the Black-Bear inn, at Reading, there was a stream, or canal, running under the stables, and out into the fields; in which water there were many of these fish, which lay rolling about in sight; being fed by the travellers, who amused themselves by tossing bread to them; but as soon as the weather became severe they all disap-

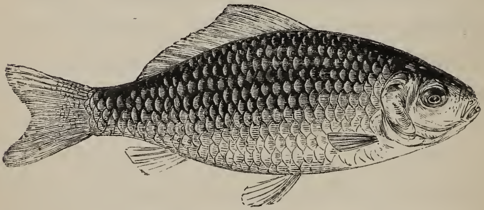


CARP.

peared, retiring under the stable, where they remained until the return of spring. Carp may easily be familiarized, and will always come to the side of the pond where they are fed. Dr. Smith, speaking of the Prince of Condé's seat at Chantilly, said that one of the most pleasing things about it was the sight of the immense shoals of very large Carp, silvered over with age, like silver fish, and perfectly tame, so that, on the approach of the travellers, they came to shore in such numbers, as to heave each other out of the water, begging for bread. They even allowed themselves to be handled.

These fish are found in most of the rivers and lakes of Europe, but the most southern and temperate parts are most congenial to them. When transported to colder regions they diminish in size, and are said, to the present time, to be unknown in Russia. They haunt deep holes, under banks and the roots of trees, and prefer a soft muddy or marly bottom. From their quick growth and vast increase (the roe when taken out is sometimes found to weigh more than the fish itself), they are considered the most valuable of all fish for the stocking of ponds. Their growth is particularly cultivated in Austria and Prussia, and considerable traffic in Carp prevails in various parts of the continent, where an acre of water lets for as high a yearly rent as an acre of land; and where fresh-water fish, as food, are held in much higher estimation than in this country. Carp are very long-lived. We are told by Mr. Bingley, that the pond in the garden of Immanuel College, Cambridge, contained a Carp, which had been there more than seventy years; and one instance is on record of an individual a hundred years old. Nay, it is even said, certain Methuselahs of the race have attained to a century and a-half and two centuries! They are also extremely tenacious of life, and will exist a very long time out of water. A Carp, placed in a net, and well wrapt up in wet moss, if fed with bread and milk, and often plunged in water, will grow very fat, and become of excellent flavour. They commonly attain a foot, or even two, in length, and some of much larger dimensions are occasionally taken.

In its general habits, this fish exhibits so great a degree of astuteness, as to be sometimes called the River Fox. It is most difficult of capture, leaping over nets, or plunging in mud, so as to allow a heavy drag-net to pass over it. "First catch your Carp," says the sagacious Mrs. Glasse, in her receipt for stewing this fish. And that is the puzzle. "In our extensive waters," observes that admirable naturalist, Mr. Lubbock, in his "Fauna of Norfolk,"—"no fish baffle the fishermen so completely as this. Every one has his peculiar tale of disappointment. How he surrounded a shoal of Carp with his turning-net; and some sprang over, and the rest 'mudded;' or, how he found them working in a dyke, and placed a trammel-net above and below them, so as to cut off retreat both ways, and then dragged the intermediate space with a third net, and after all got—only one of the smallest! I believe that some of our fenmen regard this fish with mysterious awe; his exits and entrances puzzle them; they think him something more than a fish, and look upon him as what the Scotch call, 'no cannie.'" Nor does the angler fare any better. "Angling, for Carp," says the prince of Anglers, "requires a large measure of patience." All honour to the astute, sagacious River Fox! Were I to fish, it should be for Carp; and, let me tell my young angler friend a secret, in his ear—*The 10th of April is accounted a fatal day for Carp!*



PRUSSIAN CARP.

Differing from the Common Carp, is the *Crucian*, or *Prussian Carp*. This Carp, although not much known to the angler, has been found very well adapted for the vivarium. Although not so brilliant as the gold fish, its back has metallic lustre, and the eye is of golden yellow, the belly white, and the fins of an orange red. It is found, Mr. Yarrell says, in some of the ponds about London, particularly in the vicinity of the Thames, as well as in other parts of England. Its average weight is about half-a-pound, or a pound. The *Golden Carp*, that well-known favourite of the drawing-room, originally a native of China, is now completely naturalized, and breeds freely in ponds, in many parts of this country. The extreme elegance of their appearance, the splendour of their colouring, the ease and agility of their movements, and the facility with which they are preserved in small vessels, have made these little creatures prisoners for our gratification. They have, also, an additional attraction in the docility of their manners, and appear to entertain an affection for each other. A person who kept two together in a glass, gave one of them away, on which the other refused to eat, and showed evident symptoms of unhappiness till its companion was restored to it.

It is needless to describe a species so well known. As in most creatures kept in an artificial state, its varieties in colour and in many other particulars are almost innumerable. A French author has figured no fewer than eighty-nine varieties of this Carp, in almost every possible grade of hue. The young, when first produced, are black; they afterwards change to white, and then to gold colour.

Gold fish may be fed with balls of paste and the yolk of eggs reduced to powder, and various other things. They thrive best in a temperature somewhat higher than the ordinary mean; and hence, are known to breed very freely in the engine-dams, or ponds of manufacturing districts, where the water from the steam-engines, thrown off to be cooled, has an average temperature of eighty degrees. These fish are by no means useless inhabitants of such places: they consume the refuse grease, which would otherwise impede the cooling of the water, by accumulating on its surface.

In China, gold fish are kept in ponds, or large porcelain vessels, by almost all persons of quality. In these they are very lively and active, but so delicate, that the report of heavy guns, or a powerful smell, such as of burning tar or pitch, will kill them. In each of these receptacles where they are kept, there is an earthen pan with holes in it, under which the fish can retire when they find the light or heat too great; a sort of herb is also thrown on the water to keep it green and cool. This seems to be most desirable, and the suggestion might, perhaps, be acted upon with advantage. Could not some beautiful earthenware screen be invented for the purpose, and placed at the bottom of those crystal globes which are the usual receptacles of these lovely creatures? Surely these "bauble prisons," as our lake poet has called them, might thus be rendered more comfortable to their inmates, and benevolence and right-feeling suggest, that everything which can contribute to the ease and happiness of such pets, should be done.

Wordsworth has immortalized his gold-fish, which, after admiring in their captive state, he

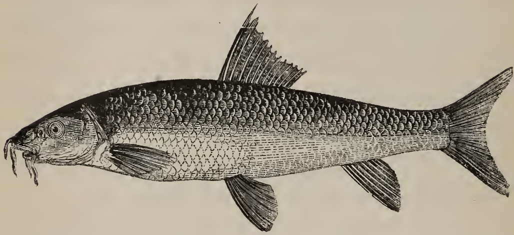
> "Removed in kindness from the glassy cell,
> To the fresh waters of a living well,"

and then proceeded to describe, in their new condition, thus—

> "Among reflected boughs of leafy trees,
> By glimpses caught—disporting at their ease,
> Enliven'd, braced, by hardy luxuries.
> I ask, what warrant fixed them (like a spell
> Of witchcraft fixed them) in the crystal cell,
> To wheel, with languid motion, round and round
> Beautiful, yet in mournful durance bound.
> Their peace, perhaps, our lightest footfall marred,
> On their quick sense our sweetest music jarred;
> And whither could they dart, if seized with fear,
> No sheltering stone, no tangled root was near?"

The *Barbel*, called the Bearded-Fish, from the barbs or wattles at its mouth, is unknown in Scotland, frequent in England, and pretty general throughout Europe. It is readily distinguished by the appendages just mentioned, as well as by the great extension of the upper jaw above the lower. Near London.

from Putney upward, these fish are found, in great quantities and of large size; but they are the coarsest of fresh-water fish, and are seldom eaten but by the poor, who sometimes boil them with bacon for a relish. They live in society, loving rapid streams and rivers, concealing themselves during the day in hollows and among large stones, and roving about at night in quest of food. In very cold weather they seem to be in a torpid state, and in autumn they retire to deep waters for shelter. Slugs, worms, and small fish are the food of the Barbel. When boring and turning up the loose soil at the bottom in search of their prey, they are accompanied by small fish, which pick up the minute animals in the disturbed soil. In confinement, Mr. Jesse says, they are exceeding shy, and most impatient of observation, although, when they could not perceive any one watching them, they would rub themselves against



BARBEL.

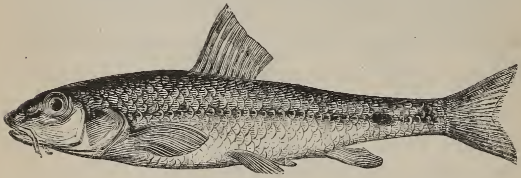
the brickwork, showing much playfulness. The general colour of the upper parts is a greenish brown; they are of rapid growth, and sometimes attain a large size, usually from two to three feet.

The following amusing account of this fish is given in the "Curiosities of Natural History:"—"The Barbel, on the contrary, has not a tooth in his head; his mouth is made for poking about among the stones at the bottom of the rivers, and procuring his food, which consists of almost anything. He is a regular fresh-water pig, and lives by picking up what he can find, be it animal or vegetable. That most observant of poets, Flood, has aptly recorded his grubbing propensities, in the following lines:—

> 'On they went, and hunted about,
> Open-mouthed, like chub or trout,
> And some with upper lip thrust out,
>   Like that fish for routing—a Barbel.

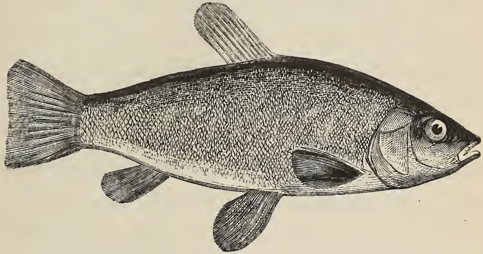
When a Barbel is hooked, he always endeavours to strike at the line with his tail, to break it. Now, if we examine the back fin of the Barbel, we shall find that the first ray of it is cut out into deep notches, just like a saw... the use of it, I imagine to be, to steady and steer him in the rapid currents and mill-streams in which he lives. If we move the serrated ray upwards, we find the whole fin follows it, and is kept tense by it, let it go, and the fin again sinks down. In the mast of a London barge we find a parallel contrivance. The barge makes headway by means of this contrivance,—so does the Barbel, only that his sail (so to speak) is opposed to water, not wind."

A pretty little fish is the *Gudgeon*, and much used as bait for large ones. It affords great sport to young anglers, and is esteemed as pleasant and light food, being often given to invalids. Its usual size is from five to six inches, and it has a single barbule at each angle of the mouth. It is found in rivers and gentle streams, especially those that have gravelly bottoms. The Thames, Mersey, and Avon are famed for their fine Gudgeons. They swim in shoals, and are frequently assembled by raking the bed of the river, when they immediately crowd to the spot, in search of the small living animals disturbed by that operation. Worms, aquatic insects, and molluscæ are their food.



GUDGEON.

The generic distinctions of the *Tench* are, that the barbules are very small, as also the scales; and the mucous secretion of the body is abundant. It is short and thick, and the colour seems to vary according to the purity of the water in which it lives. It inhabits lakes, ponds, and other still waters, and averages from four to six pounds in weight. It keeps near the bottom, and buries itself in the mud during the winter months.

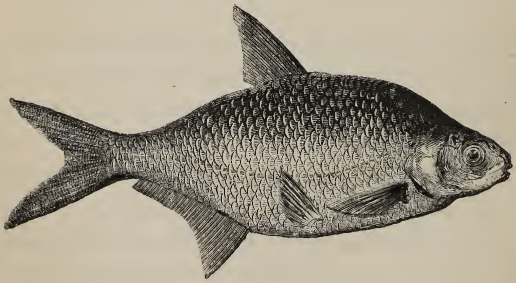


TENCH.

"This is one of our most useful fresh-water fishes (says Mr. Yarrell), from the ease with which it may be preserved and its increase promoted; the facility of transportation, from its great tenacity of life; and the goodness of its flesh, which is not, however, held in the estimation which I think it deserves." Concerning this latter quality, much diversity of opinion exists, which may probably be ascribed, in a great degree, to the difference of feeding and locality. Probably, also, the mode of cooking the fish may have much to do with it, and, by the aid of some of the famous German receipts, it could be made (as they say), "very fine this way."

The Tench, according to Mr. Lubbock, is remarkably affected by electrical influences, and fishermen often suffer great loss from thunderstorms, when they have many of these fish in trunks. There are various nostrums for remedying the evil; some say, to sink the trunk deep in the water secures the Tench; while others maintain, that the top should be level with the water, and covered with rushes. In tropical climates, hail and thunderstorms united sometimes depopulate rivers.

Very similar in its habits to the preceding, is the *Bream*, or Carp-bream, as it is sometimes called. It is by much the largest of our British species, being, in the language of Isaac Walton, a large and stately fish, from one to two feet in length; however, it is of little esteem for the table, and is usually cultivated in ponds, as food for other fish. The prevailing colour is yellowish-white, becoming darker with age.



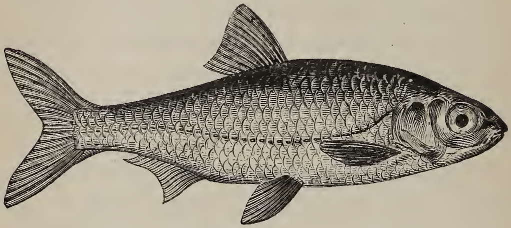
BREAM.

It thrives much in large lakes, broads, and deep rivers, and goes generally in shoals, feeding on worms and soft animal food. It is quite an angler's fish, and old Isaac gives minute and copious directions for its capture, advising careful selection of the spot, preparatory baiting the ground, and the early hour of *three or four*, ante meridian, when they may be approached, "but not too near,—for they have a cunning sentinel, and are watchful themselves also."

These fish are found on all the Norfolk broads, in immense shoals; "when preparing to spawn, they roll about like miniature porpoises; the water is discoloured by their working; here a nose appears, there a back fin; while, at intervals, a sudden plunge of affright tells that large pike are busy among them. The pike follows in the wake of these shoals, as in Africa the lion hangs on the outskirts of the countless herds of antelopes and other animals."

There is another species, of silvery hue, known by the name of *White Bream*, or Bream-flat; a much smaller fish, rarely exceeding ten or eleven inches. It is abundant on the Continent, and has recently been found in several localities in England.

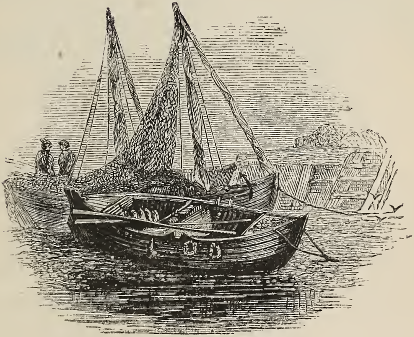
If the subtle Carp be the fox of the rivers, so is the *Roach*, according to Isaac Walton, the water-sheep, for its simplicity and foolishness. It has a strong general resemblance to its congeners, and its habits are those of the family. Its usual weight is from one pound, to one pound and a-half. It is very bony, and not much prized as food, but makes good soup. It is common in lakes, and still deep rivers throughout the country. "Sound as a Roach" is a proverb which seems somewhat puzzling. Mr. Yarrel suggests that, as in the older works on Ichthyology, this fish was called *Roche*—it should be read, "Sound as a Rock,"—there being a pun upon the word. The French have the same proverb; and the Italians associate the idea of health with fish generally—"Sound as a Fish."



ROACH.

Very similar in appearance and habits to the Roach, is the *Dace*, but smaller and longer in form, and scarcely so common.

The *Graining* is a fish quite unknown in Scotland, and seems singularly restricted in this country, having been originally observed in the Mersey, to which river and its tributaries it is confined. It is like the Dace, but smaller, rarely exceeding half-a-pound in weight. It is said to resemble the Trout both in its food and habits.



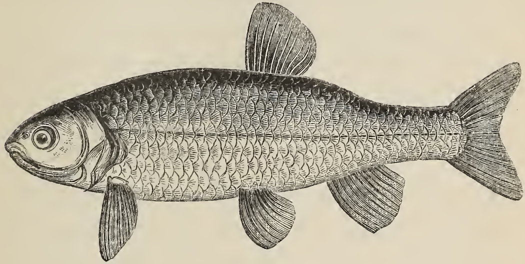
THAMES FISHING-BOATS.

CHAPTER VI.

> "What sparkles in the eddying flood,
> Dark with its canopy of wood,
> Catching anon some solar ray
> That strives to bring the golden day,—
> Lo! 'tis the gentle fishes' play.
> See how they roam their tiny ocean,
> Shoot, skim, or dive, with constant motion,
> As guides the will their frolic way.
> See, how they nestle 'neath yon root;
> Of man's intrusive footstep coy,
> Then, starting from their covert, shoot
> In very wantonness of joy!"—*Solace of Song.*

A WELL-KNOWN fish is the *Chub*, common in the Thames, and many other rivers of England. It is called the Skelly in Cumberland, from the large size of its scales. A shy and timid fish, feeding on worms and insects, and mostly caught by a mode of fishing called "dibbing." Its weight is four or five pounds; and it is reckoned a coarse fish, best when broiled with the scales on.

Apropos of this fish, Mr. Lubbock tells the following pleasant anecdote:—"When fishing some years ago in Normandy, on a capital stream, a 'great loggerheaded Chub' used, now and then, to make his appearance among the trout, which intruder on my fly, I was wont immediately to consign again to his element. Having just landed a large one, and pushed him from the bank into the water, I heard a hurried exclamation from a female voice behind me, of which nothing was distinct but the perpetual 'Mon Dieu.' On inquiry, I found the poor woman perfectly horror-struck at my thus throwing pearls away. I thought she was going to weep, as she explained that, had she but the charming fish which Monsieur had just dismissed so unceremoniously, she would have made of it 'quelque chose superbe, magnifique.' To comfort her, I promised that should any more visit me they should be preserved, and she pointed out that I must pass her cottage on my way homewards. In the evening I left three there; and on the following day was as usual on the river's bank, when I heard the same voice, and received a most hearty invitation to dine off my own Chub. As I had breakfasted early,



CHUB.

and was sharp set, this was by no means disagreeable; besides, I was curious to know what kind of viand her cookery would make of this fish. It was, as she had promised, very good; the scales and bones were absent; the watery taste was all gone; the flesh was firm and sweet in flavour; and, altogether, it might be regarded as a real victory achieved by the *cuisinière* over stubborn materials. This shows what a little pains in cooking will do for even Chub, the coarsest of fish."

The *Red Eye*, or Rudd, is named from the brilliant orange red colour of the iris, and from the golden coppery hue which ornaments its body. It is a common fish on the Continent, and also in England. It companies with the Roach, which it resembles in habits, and is a favourite fish with anglers, as bait for pike. On the Norfolk broads, where it is called the Roud, it is very plentiful. "A lively active fish, rising freely at flies and fond of sporting on the surface. It is most vivid in colouring, sometimes nearly rivalling the gold-fish. Does not often exceed two pounds; and is much better to eat than a Roach or Bream." *

Of all the fish confined in a vivarium, at Bushy Park, Mr. Jesse says, the *Bleak* were the most amusing and playful. "Their activity could not be exceeded; and it gave me much pleasure to see them on a still summer's evening, dart at every little fly which settled on the water near them; appearing always restless, and yet always happy." The little fish, thus charmingly described, is a well-known species, six or seven inches in length, which inhabits most of the English streams frequented by Roach and Dace. A favourite now with the juvenile angler, it was so in the days of Ausonius, who speaks of it as "the sport of children." Walton calls it the fresh-water sprat, and says it is ever in motion, and, therefore, called by some, the river swallow. He adds, "His back is of a pleasant, sad, sea-water green; his belly white and shining, like the mountain snow." A very beautiful description, but, alas! the very beauty of the little creature is its misfortune. The scales which make it so brilliant cause it to be the object of pursuit. On the inner surface of the scales of Roach, Dace, Bleak, Whitebait, and other fishes, there is a silvery pigment which gives them their lustre, and of which artificial pearls are made.

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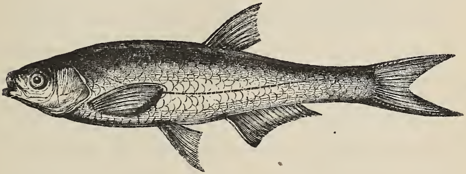
* Fauna of Norfolk, by Rev. R. Lubbock.

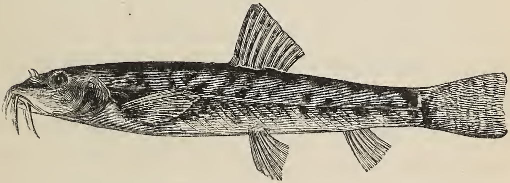


BLEAK.

Formerly the demand for these ornaments was so great, that the price of a quart-measure of fish-scales has varied from one guinea to five. The Thames fishermen used to catch the fish, and taking off the side-scales, throw them into the river again; and it was the custom for hawkers, regularly, before selling any 'white fish,' as they were called, to supply the bead-makers with the scales. Of this pigment, Whitebait afforded the most delicate and beautiful variety, and fetched the highest price: the Bleak was next in esteem, and the Roach and Dace the least valuable.

Small as it is, we must not omit to notice that universal favourite, the *Minnow*, or Pink, a species which so delights our childhood, and which, according to Father Walton, "makes excellent sport for young anglers, or boys or women that love the recreation." The external appearance of this beautiful little creature is no doubt familiar to all. It is the smallest of the genus found in Europe, its greatest length seldom exceeding three inches. It makes its appearance in our streams in March, and disappears in October, passing the intermediate months beneath the sheltering banks, or buried under the gravel. It is a very gregarious species, and small shoals are to be found in almost every shallow river, especially in clear weather; for they seem to delight in warmth and sunshine. The colours vary greatly in different fish, and in the same individuals, especially during the spawning season, when the males are brilliantly adorned with ruddy green and gold. The flesh of the Minnow is delicate, and of good flavour, but the size is too small to make it of value. Mr. Lubbock says, in some parts of France it is much larger and very abundant, and "when cunningly dealt with, most excellent for the table."

Another small and familiar species is the *Loach*, or Beardie; always readily distinguished by having six barbules about the mouth. Like other fishes provided with these appendages, it feeds at, or near, the bottom of the river, and from its habit of lurking beneath stones, it is so often overlooked, as to be sometimes considered scarce. It is, however, not uncommon in our rivers and brooks. From its slimy smoothness and activity it is very difficult to catch. It forms an excellent bait for eels, and is also esteemed as a dainty morsel by many, and occasionally preserved in the same manner as anchovies. In



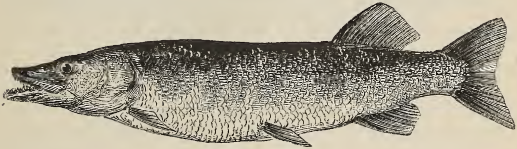
LOACH.

some parts of Europe these little fishes are so much prized for their delicate flavour, that they are transported from their native rivers to other districts. Thus, Linnæus mentions, that Frederic I., King of Sweden, had them brought from Germany, and naturalized in his country. They feed on worms, and various aquatic insects.

There is a smaller species, called the *Spined Loche*, or Groundling, which is much less frequent, and found only in a few localities.

The *Family of the Pikes* is the second, in this (Second) Order of Osseous Fishes. We have four acknowledged British species, viz:—The Pike, Garfish, Saury-pike, and the Flying-fish.

Our well known *Common Pike*, "the shark of the fresh waters," scarcely needs description. Numerous are the appellations which have been given it, descriptive of its propensities, which need not be enumerated. The term *Jack* is applied to the young fish, under a foot or two in length. This is the only species of Pike which occurs in our fresh waters, or in those of Europe generally. It is one of the largest of river or lake fishes, and, if the accounts given of it by some writers be not much exaggerated, it sometimes attains an almost gigantic size. Individuals are mentioned as being from five to eight feet in length (the common size is from two to three feet): and its age is said to be as remarkable as its dimensions. One of ninety years is on record; and Gesner has related that one of these fishes was taken in Suabia, in the year, 1497, which had a brazen ring attached to it, bearing a Greek inscription, from which it appeared the fish was 269 years old. It weighed 350 pounds, and the skeleton, nineteen feet in length, was long preserved at Manheim. "The flesh of the Pike is of good quality," says Yarrell, "and those of the Medway, when feeding on the smelt, acquire excellent condition, with peculiarly fine flavour." The smaller or middle-sized Pikes are the best eating.



PIKE.

Wondrous tales are told of the boldness, voracity, and fierce nature of this fish. "From the very ovum," says Mr. Lubbock, "it appears to manifest the stern and solitary energies of its nature. In summer, almost every distinct puddle in fens, where turf is cut, has its tiny tyrant in an infant Pike. There he enacts despotic sovereignty, and lords it over tadpoles and fry, till fate arrives in the shape of a heron; or the first floods of autumn sweep him to the river or broad, there to batten in plenty—until his turn arrives to figure, crowned with horse-radish, his tail in his mouth, and a pudding in his belly."

Among the various localities in England remarkable for the quality and quantity of their pike, Horsea Mere and Heigham Sound, two large pieces of water, in the county of Norfolk, have been long celebrated. Camden, in his famous lines (written in 1586), says—

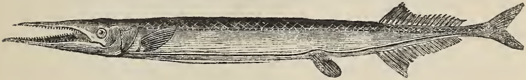
> "Horsea Pike.
> None like;"

and Horsea Pike still preserve their good character.

This fish is angled for in a variety of ways,—by fixed or set lines, and also by trimmers or liggers, as they are provincially called in some parts. This mode is well described in Mr. Yarrell's "British Fishes." Altogether, the great strength, gigantic size, and formidable weapons of the "mighty luce, or pike," render it a fish of consideration. As to its appearance, like all fish, it bears about it some beautiful tinting when fresh; but its long, lank jaws, and sunken eyes, certainly give it an evil and malignant expression, and its physiognomy may be characterized as "ill-favoured."

Associated with the true Pike, is the *Gar Fish*, or *Sea Pike*, alias Mackerel-guide, Greenbone, Sea-needle, or Garrick; for this remarkable fish has many names, which have been suggested by its appearance or habits.

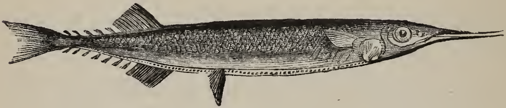
It is common on many parts of the coast, appearing in shoals about April, and remaining till late in autumn. Its length is from eighteen inches to two feet; the jaws are very long, slender, and sharp-pointed, with numbers of small teeth; and the body is very slender. On account of its leaving deep water in spring, to spawn near the shore, preceding the mackerel in their annual visit for the same purpose, it has received the name of mackerel-guide. It is said to swim near the surface, and not unfrequently it springs out of the water, its vivacity being so great that it will for a long time play about a floating straw, and leap over it many times in succession. It freely takes a bait, and strikes at it generally obliquely upward, starting into the air with the line, and beating itself on the surface to get free of the hook, and in doing so it always emits a very strong and peculiar smell. So rapidly does it digest, that seldom anything is found in the stomach: it feeds freely on small crustacea, little fishes, and, indeed, "few things with life come amiss."



GAR FISH.

A curious circumstance connected with this fish is that its bones are green. This colour excites a prejudice against it as food. Considerable quantities, however, are sold in the London markets, the price being moderate. The flesh partakes of the flavour of mackerel, but is drier.

Resembling the preceding species in general appearance, but very much smaller (from a foot to eighteen inches), is the *Saury Pike*, or *Skipper*.



SAURY PIKE.

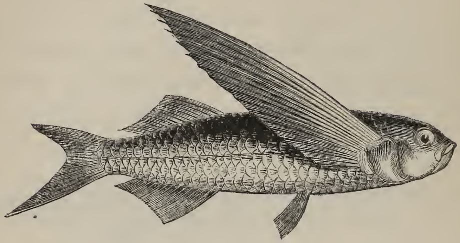
In Britain it seems pre-eminently a migratory fish, appearing usually in the autumn, in vast abundance at one time and sparingly or not at all at another. Dr. Neill says they are not uncommon in the north of Scotland; and they are also described by Mr. Couch as sometimes abundant on the Cornish coasts. This most delightful author says, that these fish do not swim in deep water; they are exceedingly rapid in their movements, and in their harmless manners resemble the flying fish, as well as in the persecution they suffer from the ravenous inhabitants of the ocean, and the methods they adopt to escape from their pursuit. They are gregarious, and sometimes may be seen to rise to the surface, and flit over a considerable space.

"But the most interesting spectacle, and that which best exhibits their great agility, is when they are followed by a company of porpoises, or their still more active and persevering enemies, the tunny and bonito. Multitudes then rise to the surface, and crowd on each other, pressing forward. When still more closely pursued, they singly spring, to the height of several feet, leap over each other, and sink again beneath. Still further urged, they mount again, and rush along the surface, by repeated starts, for more than 100 feet, without once dipping beneath, or scarcely appearing to touch the waves. Amidst such multitudes—for more than 20,000 have been judged to be out of the water together—some must fall a prey to the enemy; but as many hunt in company, it may be long before the pursuit is abandoned."

All who have read the accounts of voyagers in southern latitudes, must be perfectly familiar with the name of the *Flying Fish.*

The flights of these beautiful little creatures, principally occasioned by their efforts to escape from their numerous foes, have constantly excited the interest and called forth the descriptive powers of travellers and naturalists. By aid of their immense pectoral fins, they have the power of elevating themselves into the air; whence they have been denominated "Flying Fish."

Occasionally, though very rarely, specimens have been observed off our shores. The most recent and



FLYING FISH.

detailed instance is given in the "Zoologist," for 1847, and is from the pen of Mr. Couch. He says: "In the summer of 1845, when about six miles off the shore, in Mount's Bay, I saw several Flying Fish start from the water, very high into the air. In a few minutes I was gratified by seeing them close to us. They were pursued by several huge striped bonitos. The enormous pectoral fins, with the large ventral ones, clearly indicated the species to be the Greater Flying Fish (the Sea-swallow, as it has been called). They rose from the water like an arrow to about ten or twelve feet, and then gradually and glidingly fell into the water again. Their flight was different from what I expected; all the velocity seemed acquired in the water, and gradually decreased as soon as they left it. It was evidently a continuation of the flight through the water; the creature possessed no power over its motions while in the air: the large pectorals seemed to facilitate their progress upwards, and to prevent their sudden dropping downwards, and to serve no other purpose, at least out of the water. The whole was like that of an arrow, and the pectoral fins served as the feathers."

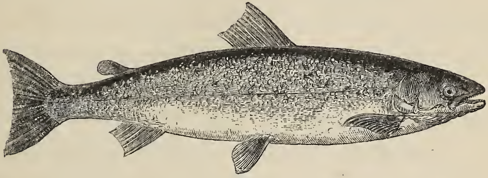
CHAPTER VII.

FAMILY OF THE SALMON AND TROUT.

> "Nor I thy scarlet belly will omit,
> O Salmon! whose broad tail with whisking strokes
> Bears thee up from the bottom of the stream
> Quick to the surface; and the secret lash
> Below, betrays thee in the placid deep.
> Arm'd in thy flaky mail, thy glossy snout,
> Slippery, escapes the fisher's fingers; else
> Thou mak'st a feast for nicest judging palates."

This chapter shall be devoted to the Family of the *Salmon* and *Trout* (*Salmonidæ*). Of all the fresh water fishes belonging to northern latitudes those composing the family of the Salmonidæ are the most important, in an economical point of view; nor are they less full of interest to the naturalist and the sportsman. Probably, in no country in the world, in proportion to its size, are the fisheries of the *Salmon* so extensive, or their value of so much importance, as in the United Kingdoms. This is a northern fish, being unknown in the Mediterranean and other warm climates. It is found in France, in many of the rivers that empty themselves into the sea, and as far north as Greenland. The principal fisheries in our islands are carried on in Scotland, the north of England, and

Ireland, where the species is very abundant. The sea may be regarded as the principal abode of this noble fish, although it inhabits both salt and fresh waters; quitting the ocean at certain seasons for the sake of depositing its spawn in security in the gravelly beds of rivers, remote from their mouths.



SALMON.

There are scarcely any difficulties but they will overcome in order to arrive at these chosen places. They will ascend rivers hundreds of miles, force themselves against the most rapid streams, and spring, with amazing agility, over cataracts of several feet in height. Many remarkable stories are told of these "salmon leaps," and of the surprising rate at which salmon travel up the great navigable rivers, where the beds are deep, and the interruptions infrequent. "It may be stated generally, that salmon pass the summer in the sea, or near the mouth of the estuary, in autumn they push up rivers, in winter they inhabit pure fresh water, and in spring return again to the sea."

Salmon spawn is generally deposited in shallow streams or creeks, a proper receptacle being made for it by the parent fish (which assume at this season much more brilliant hues than ordinarily) in the sand or gravel, about the depth of eighteen inches. It is said they use their tails to scoop out these hollows, and they are observed to have that part excoriated after the spawning season.

The eggs are covered with gravel by the mother fish—as they are called—and lie so buried until the spring; while the old fish hasten as soon as possible to the sea to recover their strength, for they are then in a poor emaciated condition. (At this season they are called Kippers.) The males precede the female fish in their migration.

Almost as soon as they are able to swim, the young brood (called Smolts, or Samlets, and in their first year Grilse) begin to make their way to the sea, where their growth is so rapid that although when they leave they may not weigh more than one or two ounces, on their return in July and August to fresh waters, they have often attained from half a pound to four or five pounds.

It is a very remarkable habit of this species of fish that it always endeavours to return into the same river it was spawned in, which has been ascertained beyond doubt by marking the fry (cutting the fins, passing threads through them, and in various ways).

Surely this return of Salmon to their native streams is one of the most curious facts in natural history. Do we not find in it something exceedingly analogous to the extraordinary instinct possessed by our migratory birds, and which leads them, after wandering to far distant climes, to return, and seek precisely the same locality, year by year?

How admirable are these orderly and interesting proceedings on the part of the various creatures by which we are surrounded! Calculated to call forth our admiration and praise to Him who has given to them such unerring instincts; well may these things be "sought out of all them that have pleasure therein."

Of a fish so well known as the Salmon, description is unnecessary. The greatest weight to which it attains is from forty to fifty pounds. Its food, at sea, is believed to be principally the sand eel; in the river, worms, aquatic insects, and small fishes. It is said to have an aversion to anything red—so that the fishermen are generally careful not to wear jackets or caps of that colour.

There are various different modes by which the Salmon are taken; and the fisheries are as numerous and extensive as the value and quantity of the fish would lead us to expect. Many well-known and excellent works are specially devoted to this subject. Passing by these, I will entertain my readers with the sagacious exploits of a four-footed Salmon-hunter.

A gentleman going from Portsmouth to the Giant's Causeway, had occasion to ford the river Bush near the sea, and as the fishermen were about to haul in their net, he stopped to see their success. The men were accompanied by a water-dog of the country, and as soon as they began to move, this animal instantly ran, of his own accord, to the river, and took post in the middle of it, on some shallows, where he could occasionally run or swim. He manifested in his proceedings all the eagerness and attention of a pointer dog which *sets* his game ; and the event soon justified his prudence ; for the fish no sooner feel the net than they directly make out to sea. Accordingly, one of the Salmon, escaping from the net, rushed down the stream with great swiftness, towards the ford where the dog was posted, prepared to receive him at an advantage.

A very diverting chase then ensued, in which the fish performed a series of rapid turnings and windings, and after a sharp pursuit, the dog found himself distanced, in consequence of the water deepening, by which he had been compelled to betake himself to swimming. Finding this a losing game, he presently gave it over, and ran with all his speed down the river, till he was sure of being again to seaward of the Salmon, when he took up a post as before, in his pointer's attitude. Here the fish for the second time met him, and a fresh chase ensued, in which, after various attempts, the Salmon at length succeeded in making its way out to sea, notwithstanding all the ingenuity and eager exertions of its pursuer.

Though the dog was baffled on this occasion the fishermen said it was no unusual thing for him to run down his game; and they added, that he was of great use to them, by turning the Salmon towards the net.

A Thames Salmon is a prize which occurs but seldom. Mr. Yarrell mentions that the last of which he had a note was taken in June, 1833. The appearance of the common Tern, or Sea Swallow, which, on its arrival in May, wings its flight for miles up the Thames, is a signal for the fishermen to keep a sharp look-out for one of these fish. In consequence of the occasional coincident appearance of the Tern and the Salmon, the former has sometimes been called the Salmon-bird.

The *Bull Trout*, or Gray, is the largest of the British Salmonidæ, next to the true Salmon, often measuring between two and three feet. It is, however, not so elegant in shape, nor is the flesh (which cuts yellow) at all comparable, even when in its highest season. It is a common species in the Tweed, where the young are called Whitlings; and it is also found in several other rivers, affording good sport to anglers. It ascends rivers for the purpose of spawning in the same manner as the Salmon, but earlier in the season.

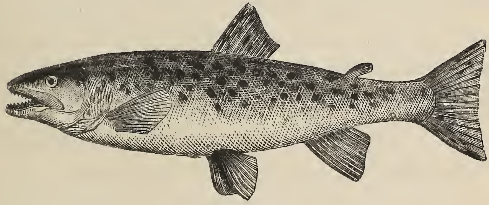
Next in value to the Salmon, and rivalling it in the elegance of its form, is the *Salmon Trout.* It is most abundant in the rivers of Scotland, and its flesh is excellent, and of red colour. The habits of this species are very similar to those of the Salmon, and shoals of them may be seen coasting the bays and headlands, leaping and sporting in vast numbers, as they are approaching the entrance of rivers. They enter every river and rivulet in immense numbers, and are taken by hundreds, in sweep nets. Their food appears to be very indiscriminate, flies, beetles, and small fish, but especially the common sand-hopper.

Great quantities of this fish are sent to the London market, being, according to old Isaac Walton, "rare good meat."

We have then three distinct species of migratory Salmonidæ; the Salmon, the Bull Trout, and the Salmon Trout. Concerning the young of these different species there has been much difference of opinion, and doubtless they have been often confounded with each other, in consequence of their great similarity, when very small. In many points, also, respecting their migrations, changes of colouring, and other things, there is still considerable obscurity.

Closely resembling the young Trout, but pronounced by some of the highest authorities to be a distinct fish, is the *Parr*, or Samlet, a small fish, from six to eight inches only in size. It is common in many of the rivers of Wales and Scotland, as well as in some of those of England.

Pre-eminently the anglers' fish is the *Common Trout*—that beautiful species, so familiarly known, and so widely diffused. An inhabitant of most of the rivers and lakes of England, it is so much the object of pursuit and gratification to sportsmen, that on many estates it is preserved with great care, and at considerable expense. The Trout never leaves our own rivers, and not undertaking journeys like its migratory allies, it is never so completely out of season as they are; while, from its partiality to insect-food, it is always ready to take a bait, and at the same time, its caution, vigilance, and activity make it sufficiently difficult of capture to call for the exercise of skill and patience.



COMMON TROUT

Its most striking characteristic is the profusion of bright red spots with which its sides are speckled; and these, together with its other brilliant hues, make it an exceedingly beautiful fish. It varies considerably in appearance in different localities, so much so as to have induced the belief that several species exist. These differences, however, seem traceable to the variety and quality of its food, as also to soil and situation. The colours certainly accommodate themselves to the tint of the water, and take the prevalent tone of the soil at the bottom; and whatever the cause of this, there can be no doubt that it is a means of contributing to the concealment and consequent safety of the fish. We observe the same assimilation of colour to the places they inhabit in the case of birds and beasts. Doubtless this is a provision for the same wise and benevolent purposes.

A weight ranging from a few ounces to about a pound includes the majority of these fish in our rivers. Many lakes swarm with Trout, and usually the average size in lakes exceeds that of rivers. A river Trout of one pound is a goodly fish, one of two pounds very fine, and one of three very rare. The Thames, at various places, produces Trout of very large size. These large fish, we are told by Mr. Yarrell, are the objects of attraction to some of the best of the London anglers, "who unite a degree of skill and patience rarely to be excelled."

Trout occasionally attain to great age—individuals are known to have lived thirty, or even fifty years. "The character and habits of Trout, their usual haunts, their favourite feeding grounds, their chosen resting-places" (says the lively author of "The Rod and the Gun") "cannot be described by human pen, so infinite is the variety of circumstances by which they are surrounded. Could any man detail their haunts and habits amply and accurately, his work would be the best and greatest of cosmographies, and 'The Anglers' Guide' would depict the universal world—for what portion of the habitable globe, worth speaking of, does not abound in fertile flowing rivers, or, in the form of broad expanded lakes, spreads not its glittering bosom to the sun?"

The very heart of the Father of Anglers warms within him on this theme: "Trust me," says he, "I have caught many a Trout in a particular meadow, that the very shape and enamelled colour of him hath been such as hath joyed me to look on him; and I have then, with much pleasure, concluded, with Solomon, that 'everything is beautiful in his season.'" *

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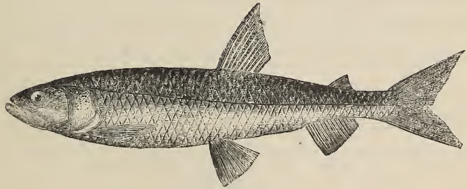
* The *Great Lake Trout* is a fish, long known to anglers, in the large lakes of Scotland and Ireland; it is of great size, weighing from ten to twenty pounds. The flavour is coarse and indifferent.

"The best *Charr* are in Coniston waters, but they are good everywhere, especially to the hungry traveller sitting at table within sight of the waters whence they have just been fished. The potted Charr of Coniston is sent, as every epicure knows, to all parts of the world, where men know what is good." So says Miss Martineau, in her "Guide to Windermere;" and indeed this pretty and delicate fish is, in a culinary point of view, among the most highly prized of all our permanently fresh-water species. Charr are abundant, not only in several of the English lakes, and a few of the Welsh ones, but in the greater number of those of the north of Scotland, when of any considerable extent. These fish are of great repute in the Lake of Geneva, and are also found in many of the mountain lakes of the north of Europe. Hence the species has been designated *Salmo Alpinus.*

When in full condition they are very beautiful. They vary greatly in colour at different seasons, and this has led to much confusion, and naturalists have been doubtful whether there are not two or three distinct species. In fact, the whole history of the fish has not yet been clearly made out. In its ordinary state it has been called the Case Charr; when wearing the brilliant crimson colour on the under surface, which it assumes in the spawning season, it is the Red Charr; and when out of season, the spawn having been shed, the colours are dingy and pale, it is the Gilt Charr.

Its food are insects and worms. It inhabits clear and pure waters, and the deepest parts of those lakes where it is found; and is rarely known to wander into streams, except at the season of spawning (November and December). The weight is commonly under a pound, though it sometimes exceeds two pounds.

The *Smelt*, or Sparling; is a well-known and favourite little fish; its fragrant cucumber smell and delicate and peculiar flavour, causing it to be generally in great request. It frequents sandy shores, especially on our eastern and western coasts, generally near the mouths of rivers, which it ascends for the purpose of spawning.

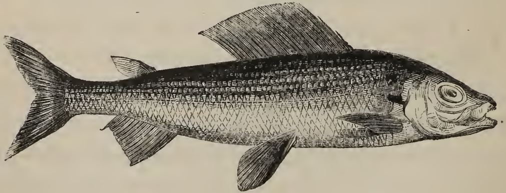


SMELT.

The Thames formerly produced this fish in great abundance, but it has now become scarce. The excellence of the Medway Smelt is well-known. Small crustacea and testaceous animals, in particular the shrimp, are the food of this species, which differs very much in size, as every one knows who frequents our fish-stalls.

Smelts have been kept for years in fresh-water ponds, without any deterioration of size or quality. They were not affected by frost, though the whole pond was frozen over so as to admit of skating.

It is a very picturesque sight to watch the "smelters" carrying on their nocturnal occupation. March is the time when the fishing begins, and it lasts till the middle or end of April. A very impersonification of patience is the smelter, as hour after hour he perseveres, moored exactly in the same spot, with a torch attached to the side of his broad flat-bottomed boat, in flinging his immense casting-net, dropping the near side of it, at each throw, within three inches of the torch. Patiently he waits, in hope of the lucky cast which is to repay him for hours of fatigue, cold, and wet. These fish always fetch a good price in the market.

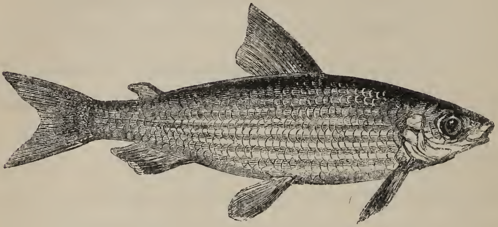


GRAYLING.

The *Grayling*, another of this family, though abundant in some streams, is yet a very local fish. The peculiarities of its distribution in this country cannot be satisfactorily accounted for, and gave rise to the supposition that it was originally introduced, probably, by the monks. It is, certainly, not a little singular that, although an Alpine fish, abundant in Norway, Sweden, and Lapland, it has not been found in any of our Highland rivers. It is a fish of elegant form, more slender than the trout; the general colour of the back and sides silvery grey. Its name is supposed to be a modification of the words gray-lines, referring to the dusky, longitudinal bars along the body. Its size is from ten to fifteen inches. It is a voracious fish, rising freely to a fly; "a very swift swimmer, it disappears like the transient passage of a shadow." It is found in Derbyshire, in some of the rivers of the north, and in a few other parts of England.

There remain two other allied species, belonging to the family of the Salmonidæ, of which a few words must be said.

The *Gwyniad* is a fish extremely similar in form to the common Herring, about ten or twelve inches in length. The Welsh term Gwyniad (white pate) has reference to the silvery white colour of the head and gills. It is abundant in Ullswater, and other large lakes of Cumberland, where the shoals are very large, and in spring and summer approach the shores, proving a great boon to the poorer classes, who preserve them with salt, and call them the fresh-water herring.



GWYNIAD.

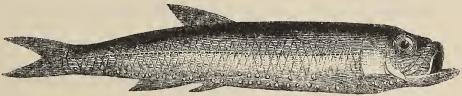
The other species is the *Vendace*, and it possesses great interest, both from its beauty and delicacy, as well as from its singularly local occurrence in this country. The only place where it is found is "the lochs in the neighbourhood of Lochmaben, in Dumfries-shire," into which, if we may believe local tradition, it was introduced by Mary Queen of Scots.

Sir W. Jardine, resident in that locality, says, "The Vendace is well known to almost every person in the neighbourhood; and if at any time the subject of fish be mentioned among the lower class, it is immediately mentioned, and the loch regarded with pride, as possessing something of great curiosity to visitors, and which is thought not to exist elsewhere."

In general habits, it nearly resembles the Gwyniad, and, indeed, most of the allied species of the genus.

This fish is considered a great delicacy, resembling the smelt a good deal in flavour. During the summer, fishing-parties are frequent, to introduce some stranger friend to this Lochmaben Whitebait. Its food seems to consist, almost entirely, of very minute animalcules, and it is never caught by anglers. The length is from four to ten inches. There can be no doubt it was imported from the Continent.

There are some four or five other dubious species of the Salmonidæ: the Argentine, the Pollan, the Lochleven Smelt, and the Powan.



ARGENTINE.

I cannot resist the temptation to prolong this chapter somewhat beyond due limits, by relating a striking incident in the life of the celebrated Sir Humphrey Davy, in which, through a remarkable interposition of Providence, he was saved from a watery grave by the courage and intrepidity of a stranger who chanced to be salmon-fishing in the neighbourhood of the place where the accident occurred. "The fall of the Traun," says Sir Humphrey, "is a cataract which, when the river is full, may be compared to that of Schaffhausen for magnitude, and possesses the same peculiar characters of grandeur in the precipitous rush of its awful and overpowering waters, and of beauty in the tints of its streams and foam, and in the form of the rocks over which it falls, and the cliffs and woods by which it is overhung."

In this beautiful spot an accident occurred, which had nearly proved fatal to this eminent man. He had taken one of the boats used for descending the canal or lock, artificially cut in the rock by the side of the fall (on which salt and wood are usually transported from Upper Austria to the Danube), and desired two of the peasants to assist his servant in permitting the boat to descend to a level of the river below, his intention being to amuse himself by this rapid species of locomotion along the descending sluice.

For some moments the boat glided gently along the smooth current, and he enjoyed the beauty of the moving scene around him, and had his eye fixed on the bright rainbow upon the spray of the cataract above his head, when suddenly his attention was aroused by a shout of alarm from the banks; and looking round, he saw that the piece of wood to which the rope had been attached had given way, and the boat was floating down the river at the mercy of the stream.

At first he did not feel alarmed; for he saw the attendants were procuring long poles, with which it seemed easy to arrest the boat before it should enter the rapidly-descending water of the sluice; and he called out to them to use their utmost force to stretch the longest pole across the water, so that he might be able to catch the end of it in his hand.

Just at that critical moment, a breeze came suddenly down the valley, and blew from the nearest bank. The boat was turned by it out of the side-current, and driven nearer to the middle of the river, and it was soon apparent that it was likely to be precipitated over the cataract!

What followed is thus related by Sir Humphrey himself: "My servant and the boatmen rushed into the water; but it was too deep to enable them to reach the boat. I was soon in the white water of the descending stream, and my danger was inevitable. I had presence of mind enough to consider whether my chance of safety would be greater by throwing myself out of the boat or by remaining in it, and I preferred the latter alternative. I looked from the rainbow upon the bright sun above my head, as if taking my leave for ever of that glorious luminary, then raised one earnest aspiration to the Divine Source of life and light—immediately after I was stunned by the thunder of the fall, and my eyes were closed in darkness. How long I remained insensible, I know not: my first recollections after the accident were of a bright shining light above me, of warmth and pressure in different parts of my body, and of the noise of the rushing cataract sounding in my ears. I seemed awakened by the light from a sound sleep, and endeavoured to recall my scattered thoughts, but in vain; I soon fell again into slumber. From this second sleep I was awakened by a voice which seemed not altogether unknown to me; and, looking upwards, I saw the bright eye and noble countenance of the unknown stranger whom I had met at Pœstum. I faintly articulated, 'I am in another world.'—'No,' he replied, 'you are safe in this; you are a little bruised by your fall, but you will soon be well; be tranquil, and compose yourself.' The next day I learned from him the history of my escape, which seemed to me almost miraculous. He said that he was fishing, the day that my accident happened, below the fall of the Traun, for that peculiar species of the large Salmon of the Danube, which, providentially for me, is only to be caught by very strong tackle. He saw, to his great astonishment and alarm, the boat in which I sat precipitated over the fall, and happily succeeded in catching hold upon some part of my dress with his hooks, when I had been scarcely a minute under water. In short, by his skilful exertions, I was safely brought to shore, and being undressed and put into a warm bed, through the use of certain modes of restoring suspended animation which were familiar to him, I soon recovered both sensibility and consciousness."

Surely, in this deeply interesting narrative we see a signal example of that providential care and interposition which Scripture teaches us are ever exerted on behalf of those who look to God for help in time of need. Be assured, my youthful reader, that the protection and mercy of God will be always exercised on your behalf while, in humble faith, you acknowledge Him in all your ways.

"The Lord is nigh unto all them that call upon Him in truth. He will fulfil the desire of them that fear Him: he also will hear their cry, and will save them."*

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* Psalm cxlv. 18, 19.

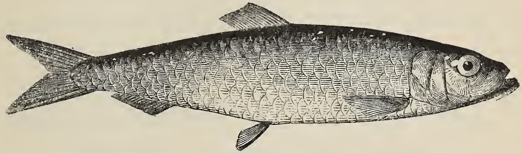
CHAPTER VIII.

> "These animated navigators enliven our coasts; some spring aloft from the surface of the waters, others balance themselves on the waves, or diverge from a common centre, like innumerable flashes of gold; these dart obliquely their shining bodies athwart the azure fluid, while they sleep in the rays of the sun, which penetrate beneath the dancing surface of the waves. All, sporting in the joys of existence, meander and return, wheel about, dash across, form in squadron, separate and reunite; and the inhabitant of the seas, inspired by a breath of existence, pursues with bounding movements its mate, by the line of fire which is reflected from her in the stream."—CHATEAUBRIAND.

THIS bright passage describes, with the feelings of a poet, the movements of those gregarious fishes which, at certain seasons, crowd our shores in myriads utterly beyond human calculation. We have already spoken of the valuable family of the Mackerel, and now proceed to

The *Family of the Herrings*, including the Common Herring, the Pilchard, the Sprat, the Shad, and the Anchovy (a rare visitant). This series of fishes includes some of the best known and most useful which our seas produce, especially the two first named species.

The fishery for the Pilchard is carried on almost exclusively in the counties of Cornwall and Devon. The Herring is more generally diffused; but the greatest numbers taken are on the shores of Scotland and the adjacent islands. Some idea of the commercial importance of these two animals may be formed from the facts that between 300,000 and 400,000 barrels of Herrings are sometimes cured in a single year in Great Britain alone, besides all that are sold while fresh; and that 10,000 hogsheads of Pilchards have been taken on shore in one part, in a single day.



HERRING.

The *Common Herring*, well known as an article of food, has been hitherto but imperfectly studied as to its natural history. Neither its migrations, kind of food, nor the causes which occasion such different degrees of excellence in various localities, have been satisfactorily investigated. On the first of these points, viz., the migrations of this fish, it seems (as has been already stated in reference to the mackerel) now generally acknowledged that the opinions of our earlier naturalists were erroneous: their supposed migrations to and from high northern latitudes do not exist. Yet that the herring is, to a certain degree, a migratory fish, may probably be true. "It is, in fact," says Mr. Yarrell, "a most capricious fish; seldom remaining long in one place: and there is scarcely a fishing-station round the British Isles that has not experienced in its visits the greatest variations, both as to time and quantity, without any accountable reason."

They appear on our shores in large shoals about the middle of summer, and seem to approach the coast of Scotland earlier, as the fishing in Sutherland commences in June, while the Yarmouth season rarely begins till September. These shoals are sometimes known to approach the shore with such headlong impetuosity, as to be unable to regain deep water, and are stranded upon the beach in immense numbers.

Mr. Mudie has described such an incident. One of these strandings took place in and around the harbour of the small town of Crail, not many years ago. "The water appeared at first so full of herrings, that half-a-dozen could be taken by one dip of a basket. Numbers of people thronged to the water's edge, and fished with great success; and the public crier was sent through the town to proclaim that 'caller herrin,' that is, herrings fresh out of the sea, might be had at the rate of 40 a penny. As the water rose, the fish accumulated, till numbers were stunned, and the rising tide was bordered with fish, with which baskets could be filled in an instant. The crier was, upon this, instructed to alter his note, and the people were invited to repair to the shore, and get herrings at one shilling a cart-load. But every successive wave of the flood added to the mass of fish, and brought it nearer to the land; which caused a fresh invitation to whoever might be inclined to come and take what herrings they chose gratis. The fish still continued to accumulate till the height of the flood, and when the water began to ebb, they remained on the beach. It was rather early in the season, so that warm weather might be expected; and the effluvia of many putrid fish might occasion disease; therefore the corporation offered a reward to every one who would remove a full cart-load of herrings from that part of the shore which was under their jurisdiction. The fish, being immediately from the deep water, were in the highest condition, and barely dead. All the salt from the town and neighbourhood was instantly put in requisition, but it did not suffice for the thousandth part of the mass, a great proportion of which, notwithstanding some not very successful attempts to carry off a few sloop-loads in bulk, was lost."

The mode of fishing for herrings is by drift-nets;

very similar to those employed for taking mackerel and pilchards, with a slight difference in the size of the mesh. Great practical skill is necessary in the arrangement of these fish-traps, that the net may hang properly and at the right depth; for according to wind, tide, situation of the food, and other causes, the herring swim at various distances below the surface. The net is suffered to hang in a perpendicular position, like a screen, and the fish, when they endeavour to pass through it, are entangled in its meshes, and cannot disengage themselves.

Whether in deep or shallow water, the fishing is always carried on during the night; and the darkest nights, and those in which the surface is ruffled by a breeze, are considered the most favourable. Nets stretched in the day time are believed to frighten the fish away.* Having deposited their ova, the fish return to deep water, and the fishery ends for that season.†

After the nets are hauled, the fish are thrown on the deck of the vessel, and the crew proceed to prepare them for barrelling. Some open and gut them; others salt them; and the rest pack them in the barrels in layers of salt. These are the "White Herrings." "Red Herrings" require a more elaborate process, which cannot be performed on board. They must lie some days in brine, after which they are taken out and strung by the head, on little wooden spits, and hung in a chimney formed to receive them. Then a fire of green wood, which yields much smoke but no flame, is kindled under them, and thus they remain till sufficiently smoked and dried (about three or four weeks), when they are packed in barrels for carriage.

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* In order to strengthen the nets they are all tanned; for which purpose a quantity of oak-bark is boiled till the liquor attains great consistence. The nets are placed in this liquor, and steeped in it repeatedly. Nets thus tanned are believed to last thrice as long as they would otherwise do.

† Herrings are said to feed principally on minute animalcules, when inhabiting the depths of the ocean; but there is no doubt the description of food varies considerably when they approach the coasts. The spawn and fry of small fishes, medusa and crustacea have been found in their stomachs, and they frequently take the fly of the angler.

I cannot but think my readers will be gratified with the following picture of the departure and return of the herring-fishers, off Latheron, in Caithness-shire. It is taken from "The New Statistical Account of Scotland," No. XXX.:—

"It is difficult to say which of the sights is most pleasingly interesting to a stranger; that of beholding, on a fine evening, the whole coast, as far as the eye can reach, covered with human beings in their little barks, as they issue forth from every creek, and disperse in different directions, full of life; or that of attending at one of the stations in the morning, and witnessing the return of 40, 60, or 100 boats, all crowding into one creek, most of them perhaps laden with fish to the gunwale, and then the scene of bustle and animation that succeeds and continues till night!"

And, what ought not to be omitted, as being still more delightful to the heart of the Christian and the philanthropist, is the interesting fact, that, on these occasions it is not unusual, where there are boats belonging to individuals of religious feeling and piety, for the crew to engage in worship after shooting their nets. On these occasions, part of a hymn is sung, followed by prayer; and the effect is described, by those who have witnessed it, to be truly solemn and heart-stirring, while the melodious strains of the Gaelic music, carried along the surface of the waters, blend together as they resound from boat to boat, and spread throughout the whole fleet.

Alas! this joyous scene has its melancholy reverse; for, in the midst of life, these "nurslings of the storm" are often in death. A hurricane suddenly arises during the night; the boats are all riding quietly at their nets, and unprepared to meet it. Some of the fishermen endeavour to haul their nets; others part from them, and run for the place of greatest shelter; while the rest, afraid to put up sail and encounter it, abide by their nets in the hope of the storm's abating. In proportion to the danger at sea, are the alarm and anxiety on land. The shores are crowded by inquiring relatives, hurrying from place to place, in search of husbands, brothers, or sons. Surprising instances of preservation amidst terrific dangers continually occur; yet no season passes without serious loss of property, and often also of lives. The risks are very great, and the employment, even when successful, most trying to the constitution.

Surely our sympathies should be called forth on behalf of those who toil in the great deep, and encounter its manifold and fearful dangers, to supply the wants of those who dwell in safety on the land; and very sweet it is to know that there have been hearts full of Christian love and zeal, which have been devoted to the consideration of their interests, temporal and spiritual. I am reminded, as I write, of one well known and beloved, now, alas! no longer living, who with peculiar earnestness espoused the cause of the humble fishermen, and employed her great talents, as well as the energies of her loving soul, for their well-being. From the pages of her "Fisherman's Friendly Visitor" are taken the following lines, called—

"THE MARINERS' MIDNIGHT HYMN.

I.

"Borne on the dark'ning wave
 In measur'd sweep we go,
Nor dread the unfathomable grave
 Which yawns below;

For He is nigh who trod
Amid the foaming spray,
Whose billows own'd th' Incarnate God,
And died away.

II.

"To peaceful rest we go,
And close our tranquil eyes,
Though deep beneath the waters flow
And circling rise;
Though swells the flowing tide
And threatens far above,
We know in whom our souls confide
With fearless love.

III.

"Snatch'd from a darker deep
And waves of wilder foam,
Thou, Lord, our trusting souls wilt keep,
And waft them home.
Home, where no storm can sound,
Nor angry waters roar,
Nor troublous billows heave around
That peaceful shore."

The herring-fishery is of great antiquity: "the industrious Dutch," says Mr. Pennant, "first engaged in it about the year 1164, and they were in possession for several centuries; but at length its value became so justly renowned, that it gave rise to most obstinate and well-disputed wars between the English and them." * Yarmouth has long been

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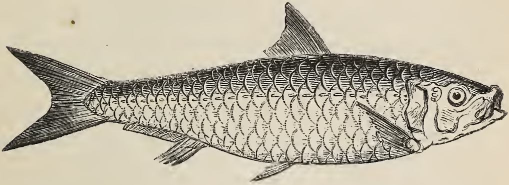
* The prosperity of Holland is, notoriously, founded upon the zeal, industry, and success with which her sons have prosecuted the herring fishery; hence the well-known Dutch saying, "The city of Amsterdam is built upon herring-bones."

famous for its herring fair. Fuller, in his "British Worthies," takes notice of the great repute the county of Norfolk was in for this fish, and facetiously calls a red herring a "*Norfolk Capon.*"

It were needless to describe the general appearance and colours of this fish. It is said to be more lively in its movements than the pilchard, and a more rapid swimmer; also more wandering and uncertain.

There is a smaller species of herring, called, by Mr. Yarrell, "Leach's Herring," the flesh of which is said to be much milder than that of the common one.

The *Pilchard* is smaller and thicker than the Common Herring, which it resembles in its general appearance. It is by no means of such common occurrence; and (as has been said) the grand resort of this fish is the coast of Cornwall, where it is found at all seasons of the year, and where a most extensive fishery is carried on. The "Quarterly



PILCHARD

Review" for October, 1857, contains an article on Cornwall, from which the following passage is extracted, as giving a picturesque description of the locality, as well as of the pilchard fishery :—

"The whole northern coast of Cornwall is of a singularly desolate and uninhabited character. It possesses only two or three wretched harbours, and the bordering villages nestle away from the blast, under the landward slope of the cliffs. These desolate regions seem abandoned by man to undisturbed myriads of wild fowl; yet there are occasions when those untrodden shores are crowded with a noisy population. The great opportunities which seem to call the very cliffs into life, are the fishery, and particularly the pilchard fishery—

'Impetuous pour
By every sheep-path steep the ruddy swarm
From woodland cot, green field, and heathy moor,
And from the earth's deep chambers dank and warm
The pallid miner comes, with spare but sinewy form,
Heaps upon heaps, upon the shelving beach
The scaly captives gasping glistening lie,
Scarcely above the empurpled waves' wide reach;
What clamour blithe, of those who sell and buy!
The voice of woman, and the urchin's cry
Shrill mingling with man's rough, sonorous tone.
The busy bulkers, in the cellars high
Up-pile the fish; no savoury task they own,
While bay-salt o'er each layer with lavish hand is thrown.'"

In this passage the poet seems to have in his eye the pilchard fishery of June and July, carried on by the drift-boats, which take the fish far out at sea, and bring their catch for disposal to the shore. But, later in the summer, the great shoals of pilchards begin to close in with the shore itself.

> " When the corn is in the shock
> The fish are at the rock,"

says the old Cornubian rhyme; and then begins the far more exciting and far more important season of the seine-fishery; a most precarious harvest, for nothing can be more unaccountable than the annual variations in the habits of this migratory fish."

A few words of statistics are given by the amusing author of " A Week at the Lizard :"—

" In 1847,—a very productive year,—40,000 hogsheads were cured; representing probably, after all deductions, a net value, to the takers, of £80,000. Of these hogsheads, 16,000 were sold at Naples, and 10,000 in the ports of the Adriatic; the two principal markets. The fish are cured simply by pressure in layers strewn with bay-salt; but the Spaniards, imagining them to be smoked, called them 'fumados;' whence, apparently, the highly inappropriate Cornish name of 'fair maids,' for these lean and juiceless relics of the ocean."

The habits of this fish vary much in different months. During January they keep near the bottom, and are chiefly found in the stomachs of ravenous fishes; in March they sometimes assemble in schulls; and thousands of hogsheads have, in some seasons, been caught in seines; but this union is only partial; and it is not till July that they regularly and permanently congregate, so as to be sought after by the fishermen.

The season and situation for spawning, and the choice of food, are undoubtedly the chief causes which influence the motions of the great bodies of these fish; and it is probable that a thorough knowledge of these would throw light upon this obscure point in their history. Many interesting details relating to the habits of the pilchard, and the various modes of its capture, are given in the "Zoologist" for 1847, by Mr. Couch, who, with his usual felicity of description, thus pictures the arrival of the large "schulls," as they commence their "great annual movement:"—

.. "The great bulk passes between the Scilly Islands and the mainland, through that sheet of water called the Lionese, like an immense army, extending itself parallel to the land. To look from Cape Cornwall, or from any of the highlands of St. Just, and see this immense moving mass, extending as far as the eye can reach, approaching the shores, and reddening the waters, is a sight of great interest and beauty, and such as would repay any exertion to witness it; they approach, and,

" 'Forthwith, the sounds and seas, each creek and bay,
With fry innumerable swarm, and shoals
Of fish, that with their fins and shining scales
Glide under the green wave, in schulls that oft
Bank the mid sea. . . . .'

"As they pass in immense shoals parallel to the shores, discolouring the waters and filling the bays, large quantities are frequently pushed on shore by the moving hosts behind. Their course can be daily watched from the hills after they have once approached the land."

The habits of the Pilchard are very peculiar: for example, when they are first preparing for their migrations, fish of the same size and fatness always herd together, so that different sieves will take very variable fish; but when the whole are united, and the migratory feeling is at its greatest development, then the largest and healthiest fish take the lead, and the weak and smaller portion bring up the rear, and form one shoal; hence the fish first taken are generally best. It is also a remarkable circumstance that, when the Pilchard has assembled, it displaces all other fish having a similar habit. The shoals are supposed by the fishermen to be guided in their movements by the larger and stronger individuals, and they always move with great precision, all their evolutions being simultaneously effected. A shoal, when inclosed, will sometimes remain motionless, in regular order, with their heads all turned in one direction. If the boat be struck loudly, the whole will instantly turn to the opposite point, without the least confusion, like soldiers at a review.

It is also a noticeable fact, that, while all the species of this genus associate in companies and shoals, the herring and Pilchard never intermingle. Small companies of each will pass and repass without mixing together; and early in the season some boats will capture herrings, while others, but a short distance from them, will take nothing but Pilchards.

The subordinate motions of the shoals are much regulated by the tide, against whose current they are rarely known to go; and the whole will sometimes remain parallel to the coast for several weeks, at the distance of a few leagues; and then, as if by general consent, will advance close to the shore, sometimes without being perceived till they have reached it. When the presence of the fish is discovered, a small boat, called *the lurker*, proceeds to the place, to ascertain the magnitude of the schull, and the direction in which it is moving. Various considerations,—as to the depth of the water, the state of the tide, &c.—enter into the consideration of the master before he gives the signal for preparation. All the proceedings are directed by signs, as the fish are alarmed at noise. Their presence is betrayed either by the rippling of the water, or the leaping of the fish, or by the colour they impart to the sea (which resembles the shadow of a cloud).

The fishery at St. Ives is regulated by a particular Act of Parliament; and there alone "huers," or watchmen, continue to be employed; formerly they were common everywhere. These huers are men posted on elevated situations near the sea, to direct the fishermen how best to surround a shoal of fish; which they do by various concerted signals, made with a bunch of furze in each hand. The stranger watches with amazement their seemingly frantic gesticulations, as they vehemently toss the bunch of furze they hold, now in one direction then in another. To good purpose is their labour, and so great their skill that their experienced eye not unfrequently detects the presence of fish when others are wholly at fault. On one occasion a huer at St. Ives raised the cry "heva," when no one else could see the least indication of their approach. The sieve, however, was shot according to his direction, in a muddy part of the bay; but still no fish appeared till many hours after, when they all rose to the surface simultaneously, and 1,200 hogsheads were afterwards taken up.

On the northern coasts large catches are annually made about October and November, and sometimes December. At this time they swim deep, rising in proportion to the fineness of the weather; for Pilchards are very sensible to atmospheric changes.

The winter fish are larger, but by no means so oily as those of the summer: a hogshead of summer fish will produce on an average about four gallons of good oil; the winter fish but two, or, when very good, three. There is, we are told, "a decided difference in every particular between the two sets of fish."

The most successful time for the drift-net fishing is during hazy nights, with some motion of the wave, for the fish then enter the nets freely; whereas in clear moonlight they are shy, and in very dark nights, such is the brightness of the brining,* that the nets look like a wall of fire, and deter the fish.

Pilchards feed with voracity on small crustaceous animals, and their stomachs are often found crammed with thousands of a minute species of shrimp, not bigger than a flea. It is probably when they are in search of such food that the fishermen report they have seen them lying in myriads quietly at the bottom, examining with their mouths the sand or small stones in shallow water.

The *Sprat* (called in Scotland, Garvie Herring), though a much less valuable fish than either of the preceding, is still a very useful one. Coming into the market in vast abundance, and at a very low price, immediately after the herring-fishery is over, it supplies, during the winter months, a cheap and agreeable food. Immense quantities are eaten, generally fresh, but they are also preserved in various ways. This species has been frequently confounded with the young of the pilchard and herring; but so well is it distinguished from both by the strongly serrated edge of the belly, that there is not (says Mr. Yarrell) a fisherman round those parts of our coast where the Sprat is taken that cannot immediately distinguish it from either, even in the midst of the darkest night.

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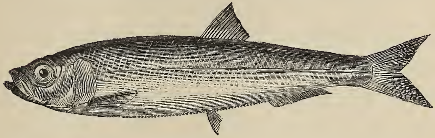
* The phosphorescent light seen in the sea when disturbed, at night.

They are taken on many parts of the coast; but, like the rest of the genus, they are wanderers; the shoals are capricious in their movements, and exceedingly variable in their numbers, as well as in the time of their appearance. For instance, in the Firth of Forth, they were seldom found in any quantity till of late years, when they have been abundant, and sold in the streets of Edinburgh by measure. Numerous places might be mentioned where they annually appear in large shoals, especially Norfolk, Suffolk, Essex, and Kent. The fishing season begins early in November, continuing through the winter months, and the largest catches are taken when the nights are dark and foggy. Not unfrequently they are so abundant as to be used for manure, and many thousand tons are annually disposed of in this manner. The length of the Sprat is from five to six inches, and its food is similar to that of the herring.

Mr. Buckland, in his "Curiosities of Natural History," invites us to examine the mouth of a Sprat; "it looks," says he, "a little tiny mouth, not large enough to admit a pin's head; but just push down the lower jaw, and what do you see? Why, one of the most beautiful insect nets it is possible to conceive. A net into which you can get the top of your little finger, and of necessity terribly destructive among the minute sea creatures which the Sprat feeds on,—those pretty little animals which cause the sea to be luminous at night, forming, doubtless, part of the bill of fare. Lately, when going over to Guernsey in the steam-boat, I observed the captain feeding the gulls which followed the vessel with Sprats, of which there were many basketfuls on board. 'Sending coals to Newcastle,' thought I; but I soon found out there are no Sprats caught in the Channel Islands. I showed the captain the mechanism of the Sprat's mouth, and he informed me that, when opened, it much resembled the net used by fishermen in catching the Sprat itself; so that the fish has furnished its captor with a pattern for an instrument to work out its destruction."

"During the month of July there appear in the

Thames, near Blackwall and Greenwich, innumerable multitudes of small fish, which are known to the Londoners by the name of *Whitebait.* They are esteemed very delicious, when fried with fine flour, and occasion, during the season, a vast resort of the lower order of epicures to the taverns contiguous to the places they are taken at."



WHITEBAIT.

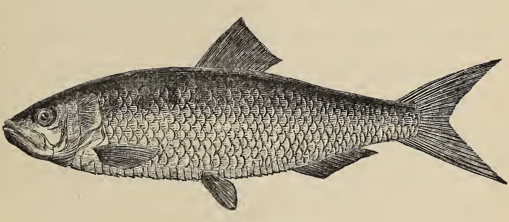
Such is Mr. Pennant's notice concerning this celebrated little fish, which he rightly conjectured to be an independent species. He wrote, however, more than half a century before Mr. Yarrell, who appears somewhat indignant at the implied stigma upon this choice delicacy. He assures us that "at present the fashion of enjoying the excellent course of fish served up either at Greenwich or Blackwall is sanctioned by the highest authorities,—from the Court at St. James's Palace, in the west, to the Lord Mayor and his Court in the east, including the Cabinet ministers, and the philosophers of the Royal Society,"—and adds, with amusing *naïveté,* "as might be expected, examples so numerous and influential have corresponding weight, and accordingly there are few entertainments more popular or more agreeable than a Whitebait dinner."

As a naturalist, Mr. Yarrell's interest in this fish led to much diligent investigation, the result of which was clearly to prove it a distinct species: it had formerly been generally regarded as the young of the shad. It is somewhat curious that this species has been observed only in the Thames; it is however thought probable that, if sought carefully, it might be found elsewhere.

From the beginning of April to the end of September Whitebait is caught in the Thames, as high up as Woolwich or Blackwall, every flood-tide, in considerable quantities, by a particular mode of fishing, in which the net does not dip more than four feet below the surface of the water, these fish remaining near the top. The length is from three to four inches; the colour of the back, pale greenish-ash, nearly all the other parts silvery white. Its food consists of minute crustacea. It is only taken in brackish water, and returns down the river with the first of the ebb-tide. Attempts to preserve them in pure fresh-water have uniformly failed.

We have two British species of the *Shad*, both of which have great resemblance, except in size, to herrings, and have been frequently called "Mother of the Herrings."

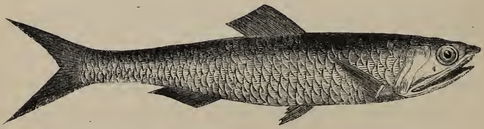
The *Twaite Shad* is a fish of some size, measuring from ten to seventeen inches. It is a migratory species; ascending large rivers in numerous troops, in the month of May, or earlier, for the purpose of spawning, and returning to the sea about the end of July. It is very abundant in the Thames, where great numbers are taken every season, although they yield but small gain to the fishermen, their flesh being coarse and insipid. The principal spawning-time of this species, in the Thames, is about the second week in July, when numbers may be seen and heard frisking near the surface. In the language of fishermen, the Shad are said to thrash the water with their tails. They appear by this violent muscular action to disencumber themselves of the roe; and on a calm still evening or night the noise they make may be heard at some distance. The Twaite is readily distinguished from the other native species by its having distinct teeth in both jaws, and by a row of dusky spots along each side of the body. Mr. Couch says this fish frequents the western parts



TWAITE SHAD.

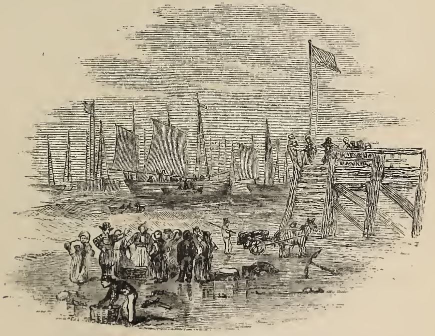
of Cornwall in rather large numbers, and is considered by the fishermen, who take it in the mackerel nets, as a mongrel herring.

The *Allice Shad* is a much larger fish than the preceding, measuring from two to three, and sometimes four feet, and weighing from four to eight pounds. It is, therefore, by far the largest of the family of herrings found in our seas. It is very local, abounding in the Severn, but much less known elsewhere. The flesh of this species is said to be of superior flavour to the former, and to improve the higher the fish ascends the river. Ælian says the Shads appear to take pleasure in the sounds of musical instruments; but if it happen to thunder when they are ascending rivers, they rapidly return to the sea.



ANCHOVY.

The *Anchovy* is a name familiar to all, as affording a piquant preserved kind of sauce, in very general request. It is a common fish in the Mediterranean (where a most extensive fishery is carried on: the fishing being prosecuted by night, lights are used with the nets to attract the fish), from Greece to Gibraltar, and was well known to the Greeks and Romans, who prepared from it a celebrated pickle, called Garum. It is a fish of small size, seldom measuring above six inches and a half in length,—the form slender and tapering towards the tail; the head long and sharp-pointed, the upper jaw being considerably the longer. The back is greenish blue, nearly all the other parts silvery white. This must be ranked among our rare fish, although it has been observed in several different places, and is even sometimes numerous on the Cornish coast.



THE BEACH AT YARMOUTH DURING THE HERRING FISHERY.

CHAPTER IX.

THE FAMILY OF THE CODFISH. (Gadidæ.)

ORDER III.—SUB-BRACHIAL SOFT-FINNED FISHES.

THE soft-finned fishes of the Second Division—or those forming the Third great Order, according to M. Cuvier's arrangement, next succeed. These are characterized by having the ventral fins placed very near the pectoral ones; the bones which support the former being attached to the bones of the shoulder: and in consequence of this construction they have been appropriately called *sub-brachial.*

This division contains some of the species most valuable as articles of food and commerce; among which rank foremost many of those belonging to the first family, that is,

The *Family of the Codfish*, which is very numerous, containing no fewer than sixteen recognised species of our native fishes (all of which, with the exception of one, are salt-water fish), besides four or five questionably admitted, or very rare.*

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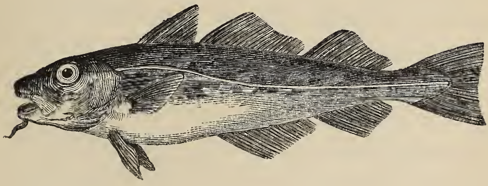
* They are, the Common Cod, Haddock, Bib, or Pout, the Poor Cod, Whiting, Coal Fish, Pollack, Hake, Ling, Burbot, the 3-Bearded and 5-Bearded Rockling, Mackerel Midge, Torsk, Common Fork Beard, and Tadpole Fish.

Of these the *Common Cod* is by far the largest member of the genus to which it belongs, and is a fish almost universally known in cold and temperate climates, being very generally distributed and extensively captured. It ranges from Iceland very nearly as far south as Gibraltar, but does not enter the Mediterranean. While the herring and mackerel families, coming in swarming shoals into the shallow waters, are usually taken by nets, the Cod, having very different habits, is caught singly, by hook and line. This fish rarely enters the shallows, but haunts the deep waters, feeding at or near the ground, where it prowls about rather than actively pursues any prey. It is a most voracious eater, and not at all particular as to the quality or nature of its food. Marine worms, crustacea, and shelled mollusca form its most usual supply; but it is also known to prey upon the smaller kinds of fish and their fry. A very long list it would be were one to attempt to enumerate all the lower orders of marine



COMMON COD.

animals which go to fill up the bill of fare. Suffice it to say, it has been deservedly called the sea-ostrich; all sorts of unaccountable substances finding their way down the gullet of this omnivorous fish, including grain, potato, paper, feathers of birds, —in one case a whole partridge, and a mass of hair, —nay, even stones as large as a goose egg have occasionally been swallowed! Happily these fishes, like birds of prey, cast up whatever they cannot digest.

As an instance of the quantity of the food devoured at one time, it may be added that no fewer than thirty-five crabs, none of them smaller than a half-crown piece, were taken by Mr. Couch from the stomach of a single Cod. This voracious appetite is a favourable circumstance for the fisherman, who finds little difficulty in taking the fish with almost any bait.

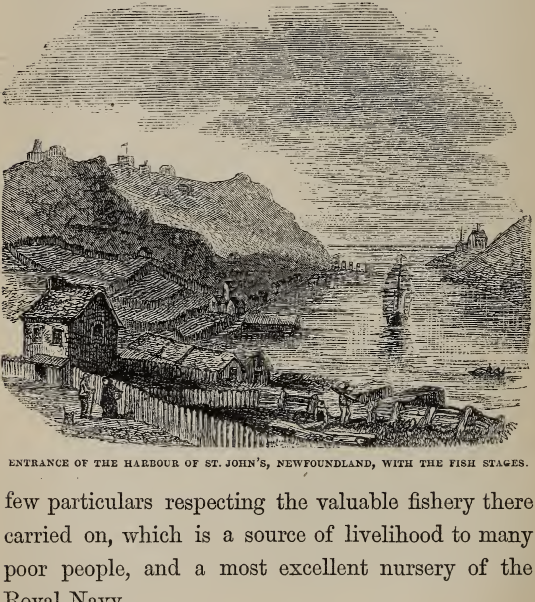
In this country the Cod appears to be caught in considerable plenty all round our shores, but it is most abundant on the north and west coasts of Scotland. There are two different modes of fishing in common use: one by deep-sea lines, the other by hand-lines, held by the fisherman. These two methods are practised, to a great extent, nearly all round the coast; and enormous quantities of Cod, haddock, whiting, coalfish, pollack, hake, ling, torsk, and all the various flat-fish, usually called "white-fish," are taken. Of Codfish only, the number thus caught in one day is very considerable; in the United Kingdom alone, this fish, in the catching, the curing, the partial consumption and sale, supplies employment, food, and profit, to thousands of people.

In some of the Hebrides there are large pools for the preservation of sea-fishes, hollowed out of the solid rock, and communicating with the sea at high tide. Great numbers of Cod are kept in these vivaria, and are found to do well. Mr. Yarrell decribes one at Logan, in Galloway, as being a basin, 30 feet in depth and 160 in circumference, hewn out from the rock, and communicating with the sea by one of those fissures common to bold and precipitous coasts. A fisherman was attached to this preserve, whose business it was to feed the fish regularly; and several species soon learned eagerly to take their supply from the hand. No sooner did the man or his son appear with the well-known basket of food,—whelks, limpets, and other testacea (boiled, to free them from the shells),—than a hundred mouths were simultaneously opened to greet the arrival. The Codfish were the most numerous; and one of them, which had been in confinement there twelve years, had attained a great size.

But the most extraordinary character in the way of a Codfish is one mentioned by Mr. M'Diarmid, in his "Sketches from Nature." When giving an account of the tameness of fishes kept in a pond of sea-water, he says that some of them were so perfectly tame that they would eat greedily out of the hand; while others were so shy, that the keeper discoursed of their different *tempers* as a thing quite as palpable as their different sizes. He goes on to mention one gigantic Cod, the patriarch of the pond, which the man said answered to his name, and not only drew near, but put up his snout most beseechingly, when he heard the word "Tom." This creature had spent fifteen years in captivity, increasing gradually in bulk and weight, but, probably from old age, had become perfectly blind. Perhaps this infirmity had helped to render poor Tom the tamest fish in the pond, by disabling him for scrambling with the rest for food. The fisherman was evidently fond of him, and very kind; and it was really affecting to observe the animal raising himself in the water, resting his head on the feeding-stone, and allowing it to be gently patted or stroked. It was sufficiently evident that he knew the voice of his keeper, and his touch too, from those of a stranger, for as soon as Mr. M'Diarmid approached, and attempted to touch him, he winced, and retreated into the water, although he presently returned to his old station. Old Tom died in 1826, after being seventeen years a prisoner.

The Cod spawns in February; and so prolific is this species, that it is usually selected as affording one of the most extraordinary examples of animal fertility. Nine millions of eggs have been found in the roe of one female. The highest season for all the fish belonging to this family is during the winter months. In summer the young fry are seen associating with sprats, herrings, &c., about six inches long, freckled with light brown and yellow; and as autumn advances they gain strength and size rapidly, and are taken by the fishermen, who call them Codlins, Skinners, and Tamlin Cod. The usual length of the Cod is rather under three feet; the fish of ordinary size being most esteemed for the table; they are chosen by their plumpness and roundness, especially near the tails, and by the regular undulated appearance of the sides, as if they were ribbed. Not the least valuable part of the Cod is the liver, because it melts almost entirely away into a clear oil, much used in manufactures, and now in high esteem medicinally. These fish vary very much in colour; those caught on a sandy soil are light, whilst those taken from a rocky and weedy locality are darker, and frequently of a coppery brown colour. There are some of a red, or reddish brown hue, and the fish so coloured are called Red Cod, or Ware Cod. Some have ascribed these differences of colour to particular food, obtained in various localities.

It is well known that the grand rendezvous of the Codfish is on the banks of Newfoundland. As this is an English colony, and the inhabitants are all British, and subjects of the British crown, it may perhaps be not out of place to give here a few particulars respecting the valuable fishery there carried on, which is a source of livelihood to many poor people, and a most excellent nursery of the Royal Navy.


ENTRANCE OF THE HARBOUR OF ST. JOHN'S, NEWFOUNDLAND, WITH THE FISH STAGES.

The Great Bank of Newfoundland (as it is called) is not less than 330 miles in length, and there, at the bottom of the ocean, exists a vast series of submarine hills and valleys, the abode of a class of living beings deriving their subsistence from each other, and affording to the courage and enterprise of man oceanic mines of wealth wholly incalculable. "Could we see," says a recent traveller,* "those hills and valleys of the Great Bank, and the neighbourhood of the iron-bound shores of the island on its Atlantic coast, how vast would appear their population; for they must be, in favourite places, literally covered by the Cod dwelling on these downs, and by the incredible shoals of lower animals upon which that voracious, all-devouring animal subsists. The locusts, in their march of devastation, have darkened the sky as they flew, and rendered the earth invisible over whole countries when they settled to feed; but these are as nothing in numbers to the periodical journeyers of the Newfoundland seas. It is sufficient to get upon any elevated spot near the city of St. John's, and cast the eye over the stages† upon which Codfish are drying, to convince oneself that here is provided a supply of food for man, from whence the millions and myriads of the globe might draw their sole nutriment without even sensibly diminishing the supply."

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* Sir R. H. Bonnycastle.

† The fish-stages are platforms of poles, laid close together, and nailed down to a strong framework, supported by posts and shores. They are generally in the shape of small piers jutting into the water, and are frequently the only landing places in a harbour. On these the fish are laid out to dry; the surface of the ground being everywhere rugged and uneven, this device has been resorted to in order to get enough flat space.

It is impossible to conceive, we are told by eye-witnesses, much more to describe, the splendid appearance presented by the arrival of the shoals, on a beautiful moonlight night. The vast surface of the ocean is completely covered with myriads of fishes, of various kinds and sizes, all actively engaged either in pursuing or avoiding each other: the whales alternately rising and plunging, throw into the air spouts of water; the Codfish bounding over the waves, and reflecting the light of the moon from their silvery surface; the capelins, hurrying, in immense shoals, to seek refuge on the shore, where each receding wave leaves multitudes skipping on the sand, an easy prey to the women and children, while the fishermen are industriously employed in securing a sufficient quantity of this valuable bait for their fishery.

A busy scene is that which presents itself to the eye of a traveller who visits these shores in the beginning of May. Then all the population are on the alert, preparing for the fishery: laying in stores of summer provisions, and hooks, lines, nets, clothes, and the rigging of their boats. Towards the middle or end of May, the first shoal of herrings appears, followed, in the middle of June, by the capelin; and then commences the height of the fishery.

Every man, woman, and child is fully employed. A married man with a family, usually goes out accompanied by his sons, takes his bucketful of bait, and rowing to the fishing-ground (generally a mile or two outside the harbour), anchors, and commences fishing. When they get what they call a good spurt of fish, an hour or two suffices to fill the boat, which then sails away with her cargo to the stage-head. Here the fish are forked out of the boat and thrown on the stage, much after the manner that hay is thrown out of a cart. The women of the family are there to receive the catch, with sometimes a man or two. Their business is to cut the fish open, and remove the head and entrails, taking care to secure the liver, which is preserved to make oil. Afterwards the fish is split, and laid entirely open, so as to be perfectly flat. This operation, which requires much dexterity, being completed, the fish are then salted, and finally laid in the sun to dry and harden. While thus exposed they require much attention, and the women are constantly looking after them, laying them up in round heaps, with the skin outwards at night, or on the approach of rain,—in which state they look very much like small haycocks. The fishery ends in September; and as the settlers carry on the business now on the system of a general competition, a few years' industry may suffice to place a man on the road to honest independence. The value of the dry Codfish alone exported every year from Newfoundland is, on an average, about 400,000*l.*, while the total value of the exported productions in fish, oil, and skins, is upwards of 700,000*l.**

Codfish taken on the banks of Newfoundland are brought to the mouth of the Thames in stout cutters, furnished with wells, in which they remain alive. The cutters do not advance farther than Gravesend, as, if they ventured up the river, the admixture of fresh water would kill the fish.

Having narrated the proceedings of a four-footed salmon-fisher, I think, by way of pendant, the following account of a Newfoundland proficient in the same art, as given by Mr. Jukes, will entertain my readers :—

" A thin, short-haired, black dog came off shore to us to-day. This animal was of a breed very different from what we understand by the term Newfoundland dog in England. He had a thin, tapering snout, a long thin tail, and rather thin, but powerful legs, with a lank body, the hair short and smooth. These are the most abundant dogs of the country, the long-haired curly ones being comparatively rare. They are by no means handsome, but are generally more intelligent and useful than the others. This one caught his own fish. He sat on a projecting rock, beneath a fish-stage, where the fish are laid to dry, watching the water, which had a depth of six or eight feet, and the bottom of which was white with fish-bones. On a piece of Codfish being thrown into the water, three or four heavy, clumsy-looking fish, called in Newfoundland 'Sculpins' (Dragonets), with great heads and mouths, and many spines about them, and generally about a foot long, would swim in to catch it. These he would 'set' attentively, and the moment one turned his broadside to him, he darted down like a fish-hawk, and seldom came up without a fish in his mouth. As he caught them, he regularly took them to a place a few yards off, where he laid them down; and they told us that, in the summer, he would sometimes make a pile of sixty or seventy a day, just in that place. He never attempted to eat them, but seemed to be fishing purely for his own amusement. The whole proceeding struck me as very remarkable, especially as they said he had never been taught anything of the kind."

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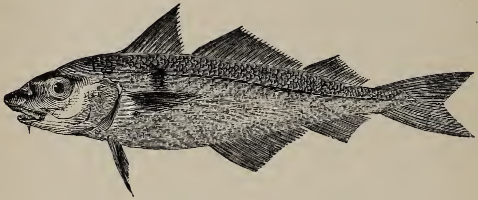
* See Excursions in Newfoundland, by J. B. Jukes.

The *Haddock* is almost as well known as the cod, and is also a very valuable fish. It frequents our coasts, from the extreme north to the Land's End, swimming in immense shoals, which however seem very uncertain as to their re-appearance in places they have formerly visited. In stormy weather these fish refuse to take any bait, and seek refuge among the sea-weeds, in deep waters, until calm be restored. Their food are small fish, and most of the inferior marine animals. They appear to eat freely of the minute crustacea, many a rare species of which has been obtained from the stomach of the Haddock.



HADDOCK.

Superstition supposes the dark marks on the sides of this fish to be the impression of the finger and thumb of St. Peter, when he took the tribute-money from the mouth of one of the species, and which (it is believed) has been continued to the whole race since the day of the miracle. There is a fatal objection to this fanciful idea, viz., the fact that the Haddock does not exist in the waters of Judea. It is not even found in the Mediterranean.

Haddocks are cured in a variety of ways; and the far-famed "Haddies" of Aberdeen are smoked after a particular fashion. In Scotland the name of this fish is pronounced almost exactly like the French *Hadot;* and, as it is the practice in the dialect of

Edinburgh, and some other places, to change certain terminations in *o* and *on* into *ie*, the fishwives of Newhaven and the neighbourhood invariably call these fish "haddies." The mention of these women recalls to my mind the beautiful and poetic description given by Professor Wilson of the fishwives of Edinburgh, whose "musical voices" he so loved to listen to.

"Saw ye them ever," he asks, "marchin' hamewards at nicht, in a baun of some fifty or threescore, down Leith Walk, wi' the grand gas lamps illuminating their scaly creels all shining like silver? And heard ye them ever singin' their strange sea-sangs: first, half-a-dizzin o' the bit young anes, wi' vices as saft and sweet as you could hear in St. George's Kirk on Sabbath, half-singin' and half-shoutin' a leadin' verse; and then a' the mithers and granmithers, and ablins great-granmithers, joinin' in the chorus, that gaed echoing roun' Arthur's Seat, and awa' ower the tap o' Martello Tower, out at sea, ayont the end o' Leith Pier? Wad ye believe me, that the music micht be ca'd a hymn—at times sae wild and sae mournfu'—and then, takin' a sudden turn into a sort o' queer and outlandish glee? It gars me think o' the saut sea faem, and white mew-wings wavering in the blast, and boaties dancin' up and down the billow-vales, wi' oar or sail, and—waes me, waes me—o' the puir fishing-smack, gaun doun head-foremost into the deep, and the sighin' and sabbing o' widows, and the wailin' o' fatherless weans ! "

Contrary to expectation, Haddocks, when kept with a variety of other sea-fish, in a small pond supplied with salt water, were found to be the tamest of all the various kinds. At ebb-tide they would come to the inner margin, and eat limpets from the hands of a little boy who tended them. There were together (beside the Haddocks), cod, coal-fish, whiting, pollack, and flat-fish of two sorts ; and it is remarkable that all these kinds of fish seemed to agree very well together,—there was no fighting among them, and very seldom any chasing of each other by the different species.

The common weight of the haddock is from two to four pounds.

COD-FISHING IN THE NORTH SEA.

CHAPTER X.

The account given in the preceding chapter of the myriad inhabitants of the Newfoundland seas will dispose us, in some measure, to agree with David Crantz, who says—"If any one were inclined rightly to study Ichthyology, or the Science of Fishes, he must reside some years (or perhaps his whole life) on the shores of the north, as the best or grandest school for this kind of information." He goes on to say—"There he might attain the knowledge of them fundamentally, and discover the nature and instincts of every species. This would be a spacious field for a curious, inquisitive mind, and he would often fall into a profound meditation when he surveys and traces in thought the nature and aim of all the inhabitants of the vast ocean, from the minutest insect, scarce perceptible to the eye, to the monstrous whales, together with the seemingly fabulous great sea monsters, and the equally inconceivable zoophytes, or half-animal sea productions. Yet, after all, the most speculative and penetrating human mind will never be able to pry so deep into the manifold wisdom of God in His creatures, as to search them out to perfection—even the meanest of them, and such as are before every one's eyes. But, for that very reason, because we are so imperfect, we are never satiated with the study of Nature, nor weary of rendering that praise to the Lord of Nature which He expects from His creatures."

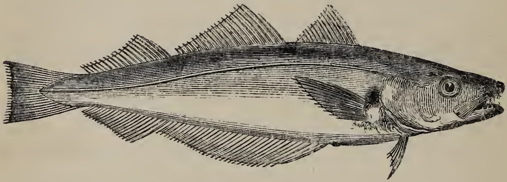
Oh that with hearts, thus tuned to love and praise, both the readers and the writer of these pages may be gifted! To glorify God in all His works is the privilege of those who have been redeemed with the precious blood of Him, who both made and ransomed the world we inhabit.

In the present chapter some account must be given of the remaining species of the Cod family, beginning with the *Bib*, *Pout*, *Whiting Pout*, or *Brassy*.

Few fishes have had so great a variety of provincial appellations as this. It may readily be distinguished from all its congeners by the uncommon depth of the body, compared to its length; and although not abundant, is yet a well-known species, and common along the southern coasts, where it is taken in considerable quantities.

During the winter it lives in deep waters, but in the spring and summer approaches our shores, preferring rocky places. It ranges northward as far as Greenland, where, according to Fabricius, it deposits its reddish-yellow spawn among the seaweeds of the smaller bays, even under the ice, in February or March. It has pretty engaging ways, and the male and female are observed to keep each other company under the same stone, which they select as a place of refuge where to dwell. The Greenlanders eat their spawn. Their food are small fish and the various animals of the shrimp kind. Their flesh is much esteemed, being very soft and delicate. With reference to the various provincial names of this fish, Mr. Yarrell says it is called Whiting Pout, from a dark spot at the root of the pectoral fin, in which it resembles the whiting; and from a singular power it possesses of inflating the membrane which covers the eyes and the other parts about the head, which, when thus distended, have the appearance of bladders. It is called pout, bib, bleus, or blinds (words probably derived from blain, blister, or bubble). The barbule at the chin is rather long and slender. The length is from ten to twelve inches, seldom more.

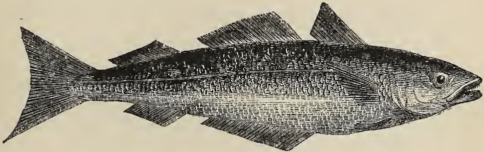
Similar in every particular to the pout, except that the body is not so deep, is the *Poor*, or *Power Cod*, the smallest of the genus, and of little value, on account of its diminutive size, which seldom exceeds six or seven inches in length. Its appearance in the Baltic is hailed, however, with great pleasure by the fishermen, since it is the forerunner of the larger kinds, and excites hopes of a rich harvest to come; hence it is called by them the Fish Conductor. It is said to be very abundant in the Mediterranean, and to go in large shoals, and it is almost the only kind of cod, properly so called, which is found in that sea.



WHITING

The *Whiting*, the most delicate in flavour of the cod tribe, is so well-known a species, that it needs not to be described here. It is caught in great abundance almost all round our coasts, and ranges from the Orkneys to Cape Clear, swimming in large shoals a few miles from the shore. The usual weight is about a pound and a half. In its habits, it is a very shy fish.

The *Coal Fish*, so called from the black colour it sometimes partially assumes, is decidedly a northern fish, and abounds in all the northern seas, and in the Baltic: it may be said literally to swarm in the Orkneys, where the young are, during the summer and autumn months, the great support of the poor. It is a fish of rather handsome form and small tapering head; the general outline and forked tail reminding one of the elegant proportions of the salmon. Not only does it yield a wholesome and substantial food, but also isinglass; and as it is a very sharp biter, and swims at no great depth, it is readily taken with the line. Mr. Low has given a lively picture of the scene he witnessed in the harbour of Orkney, where five or six hundred people of all ages may be seen, in the winter, fishing for the fry with small angling rods, about six feet long, with which simple apparatus great numbers are taken. In fact, the whole harbour is covered with boats, and the piers with men; and all are supplied, for, from the surface to the bottom of the water, it is crowded. The Coal fish attains from two to three feet in length. The young are known by many different names in various places, and the adult fish are called by the Cornish fishermen Rauning Pollacks, *rauning* being the ancient form of the word *ravening* (for voracious). It is the habit of these fish, we are told by Mr. Couch, to reside in strong currents, from which they

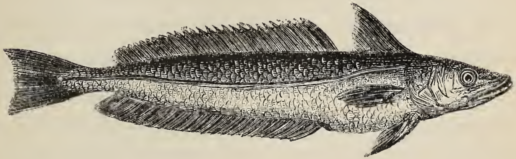


COAL FISH

shelter themselves by keeping behind large rocks. Although not in reality gregarious, they, in such a situation, congregate in large companies, with their heads towards the stream, watching any food which may be carried past them, and on which they instantly pounce. Hence they are perpetually darting from and returning to their hiding-places. When not frequenting such haunts, they wander alone, and, during the quiet weather of autumn, approach the shore, and swim about leisurely, from place to place, always seizing their prey in a violent manner. When kept in the sea-water pond, as before mentioned, these fish attained large size, and were bold and familiar, "floating about slowly and majestically, till food was thrown to them, when they seized it voraciously, and would occasionally approach the margin and take shell-fish or ship-biscuit from the hand."

Nearly as large as the coal fish, but by no means so common, is the *Pollack*, or *Lythe*, a fish found off Weymouth and Scarborough, and other rocky parts of our coasts. Pennant and others describe this species as being extremely frolicsome, frequently gamboling on the surface of the water, eagerly pursuing any object of attraction, and springing out of the waves, or flinging themselves about in a thousand ways. They are a very strong fish, and are observed to keep their station at the foot of the rocks in the most turbulent and rapid seas. The colour is dusky brown, inclining to green in the upper parts; the sides and belly whitish; the under jaw projecting much beyond the upper.

The *Common Hake*, another of the species belonging to this large and valuable family of fishes, has an

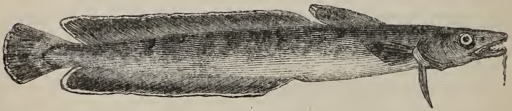


HAKE.

extensive range, being found in the northern seas and in the Mediterranean. It is taken in great abundance on many of our coasts, particularly those of Ireland. On the southern coast of England it is also plentiful. It is a fish of considerable size, commonly measuring nearly two feet in length, but not unfrequently exceeding three. It is of a slender, elongated form; the head large, broad, and flat; the mouth very wide, and armed with very long and sharp teeth, the lower jaw being the longest. Mr. Couch describes it as "very ravenous and a great vagrant." Off the Cornish coast, this fish is a constant attendant on the shoals of pilchards; but while "the movements of the pilchard are the results of natural habit and instinct, apparently independent of external circumstances, all the wanderings of the

Hake seem to be the result of insatiable appetite." They are taken, in vast quantities, in the pilchard nets; on which occasions they frequently gorge themselves upon their companions in captivity, to such an extent as to be completely disabled. When taken with the line, they generally eject the food they have swallowed. They are a coarse fish, and not very palatable; but large quantities are annually preserved by salting and drying, part of which are exported to Spain. On the northern shores of the Mediterranean, there is a considerable traffic carried on with the Hake, and they are packed in aromatic herbs, and sent to the inland towns. "The outline of the Hake," says Mr. Couch, "varies very much; the head in some specimens seems elongated."

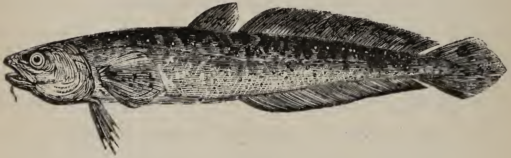
In point of size, as well as commercial value, the *Ling* can only be compared with the cod, and, perhaps, after it and the herring, it is the species which most engages the enterprise and industry of our fishermen. It is found along all the coasts of the three kingdoms, and the mode of capture and cure are nearly the same as with the cod. The larger



LING.

proportion are exported to the Spanish ports; but the traffic, on the whole, is said to yield but a trifling remuneration. Formerly the Ling was considered so important an article of commerce, that an act for regulating its price, and that of cod, &c., was passed as early as the reign of Edward III. It takes its name from its length, *ling* being a corruption of the word long. Its form is more elongated than that of the hake, and it has a barbule at the chin. The sound (air-bladder) is prepared separately, and sold pickled. The roe is used as food, or as a bait for fish; and another product of the Ling is the oil extracted from the liver, which is very large. It is used by the poor to supply the cottage lamp; and, as a medicine, has recently been found very beneficial in cases of rheumatism. This is a ground fish, its favourite haunts being the margins of the deep marine valleys and the cavernous regions of the rocky coast. In these situations it is believed to breed; and when these haunts become too densely populated, the fish migrate in large shoals to other localities. They feed on living animals of many sorts, and are especially fond of crustacea. Scilly has long been celebrated for its dry Ling.

Among a tribe of fishes, otherwise as strictly marine as possible, the *Burbot*, or *Eel-pout*, is the sole species exclusively fresh-water. It is never found but in rivers and lakes having no communication with the sea. In this country it is local, being not uncommon in Cambridgeshire, where it is called an Eel-pout. Mr. Yarrell enumerates several rivers in which it is found, and adds, "it is neither so much known, nor so much esteemed and encouraged, as from the goodness of its flesh it deserves." It is, indeed, excellent as food, but by no means prepossessing in appearance; its depressed head, nearly cylindrical body, and oval and pointed tail, give it a peculiar and not very pleasing aspect; while its smooth, slippery, and slimy skin does not enhance its attractions. It reminds one, in several respects, of an eel, which its habits also resemble; and hence the name given it—Eel-pout. It conceals itself under stones, watching for its prey, which are aquatic insects and young fish, and it feeds principally during the night. "Richly does it deserve the name of 'Cony-fish,'" says Mr. Lubbock, "which it has obtained from its habit of skulking in rat-holes and

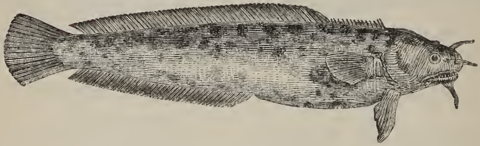


BURBOT.

corners under the banks. I have stood by whilst a skilful hand was groping under the banks of a small brook for cray-fish, and more than once, with a puzzled air, the fisherman has said, 'There is a Pout, sir; but he has got so far into a hole, I can't fasten upon him.' It is of a very hardy nature, and exceedingly tenacious of life, and surprisingly voracious. When at Lucerne, I was looking at one of the tanks for fish, divided into compartments, and supplied with fresh water from a fountain in the centre, which are common in inn-yards in Switzerland. In one division were small trout, in another eels, and in a third Burbot. Whilst I was considering these last, the scullion suddenly arrived with a plateful of the intestines of fowls, which he threw at once to the Eel-pouts. I certainly waited a few minutes, and did not see them begin their meal; but the next morning, on visiting them, I found all thus bestowed had disappeared. They grow in Switzerland to the weight of six or seven pounds, and are deservedly in the highest estimation."

In this country, the Burbot seldom attains more than three pounds. The colour of the body is yellowish brown, clouded and spotted with darker brown; the under parts lighter in hue.

There are three species of *Rockling* (genus *Motella*). The *Three-bearded*, sometimes called Whistle-fish, bears some resemblance, in its bearded mouth and general appearance, to the common loach, or beardie, and is therefore sometimes called Sea-loach; but it is much larger, averaging from a foot to eighteen inches in length. The colour is a rich yellowish brown, marked with large dark spots. Of its habits, we are told, it keeps in shallow waters, frequenting rocky ground, well furnished with seaweed, among which it threads its way with great ease and rapidity. It feeds on aquatic insects, and will take a bait; but is rarely eaten, because it smells unpleasantly in the course of a few hours. "It is not easy to explain the use of the fringed membrane behind the head and before the dorsal fin: it has nothing in common with the fins; but when the fish is lying perfectly still, and all the fins are at rest, it is often in rapid motion. The barbules on the upper jaw are always extended in front, and most likely serve the same purposes as the antennæ in insects." It seems highly probable that were this, and other kinds of the smaller fish, carefully watched, and their motions and general



THREE-BEARDED ROCKLING.

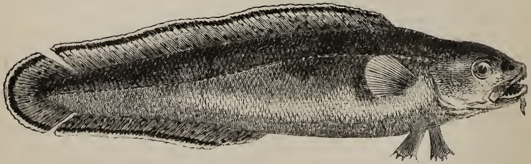
economy studied, much might be learned about them which at present is merely conjectural.

The *Five-bearded Rockling* is much more common than the preceding one, and is met with on most parts of the British coasts. It closely resembles it, but has two additional barbules on the upper lip. The general colour is dark brown, sometimes with a bronze lustre, the belly whitish, and generally it is without spots.

The *Four-bearded Rockling* has been more recently described as a British species. It is perfectly distinct from the two others, having three barbules on the upper lip, and another on the chin; and a long projecting filament in front of the first dorsal ray, which has a striking appearance. Its length is nine or ten inches, and it is found in the Firth of Forth, and the neighbourhood.

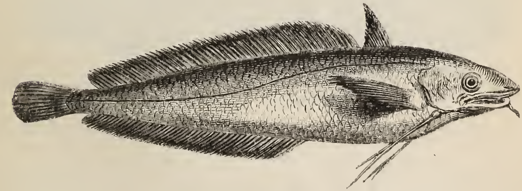
Belonging to the same genus is the *Mackerel Midge*, so called among the fishermen, as descriptive of its colour and very minute size. "It is the smallest fish with which I am acquainted," says Mr. Couch, who first noticed and described it. It is among the most exquisitely delicate of all the finny tribes that frequent our shores, and presents a distinct though miniature resemblance of all the principal peculiarities of the five-bearded rockling. Its length is about an inch and a quarter; the colour of the back bluish-green, and all the other parts, including the fins, silvery. It has five barbules. "This fish is gregarious and migratory, never making its appearance before May; after which time it is abundant, from the edge of the shore to every part of the Channel. Its winter station is probably deep in the water; but in summer it keeps near the surface, and seeks the shelter of everything it finds floating—a circumstance that often leads to its destruction, for it is frequently hauled on board the boats among the corks of nets, or with the line or floating weeds; and in a storm they are often thrown into boats, through the breaking of the sea—a fact which shows that, at such seasons, they must be on the crest of the wave." This fish dies instantly on being taken out of the water.

The *Torsk*, or *Tusk*, is a northern fish, seldom found much further south than the 68th degree, and hence little known on our coasts. It is only occasionally caught in the Forth, but more frequently in the Orkney Isles, and is plentiful among the Shetlands, where it forms a considerable article in the



TORSK.

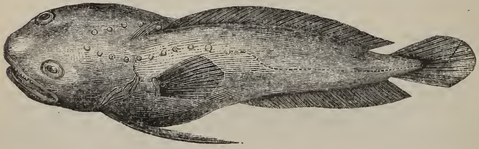
fish-trade of the islanders. "It approaches the land, early in the year, in shoals, in company with the five-bearded; and goes away again late in the summer. As it lives in the deep water, it is seldom taken, even when most abundant. The circumstance of its stomach being usually found empty, has given rise to the supposition that it lives upon the juice of seaweeds, seeing it prefers rocky ground, covered with those weeds. It must have much less power of resisting the violence of the sea than other fishes of its kind, as it is thrown up dead, in vast numbers, on the south coast of Iceland and the Faroe Islands, after a storm." Its body is long, and it has a single dorsal fin, extending the whole length of the back. The ventral fin corresponds to this behind, and is continued about half the length of the body. It has a single barbule on the chin, and is from eighteen inches to two feet in length.



GREAT FORKED HAKE.

A curious and uncommon fish is the *Great Forked Beard*, or *Forked Hake*. It has been observed in the seas of all the three kingdoms, but only in small numbers, and very rarely. It is found sometimes off the Cornish shores, where it keeps in deep waters, preferring a sandy or muddy bottom. But little is known of the natural history of this fish. Its appearance is singular, from the long bi-forked cirri on the lower part of the head, as well as from the sharp triangular fin on the back, which precedes a second, resembling that of the torsk. Mr. Couch says it seems to come into shallow water in the winter to spawn; and that it is eaten, but not in much esteem as food. Its length is from eighteen inches to two feet.

The *Lesser Forked Beard*, called the *Tadpole Fish*, is very rare. Its exceedingly singular appearance is well expressed by its name, which refers to the broad, depressed, frog-like head, which, being attached to a rapidly-tapering and compressed body, gives its general form much resemblance to a tadpole; the likeness being still further increased by the colour,



TADPOLE FISH.

which is either very dark brown or black, the folding of the lips only being snow-white. It is too rare for us to know much about its history. Perhaps the reader may gain a better idea of its appearance from the engraving.

STOW BOATS FISHING FOR SPRATS.

CHAPTER XI.

THE FAMILY OF THE FLOUNDERS, CALLED FLATFISH.

We come now to a family of Fishes very peculiar, and which deserve our attention, not only on account of their importance in a commercial point of view, but also for their singular and unparalleled deviation from the ordinary structure. These are—

The *Flounders*, popularly called *Flat-Fish* (*Pleuronectidœ*); comprising the Turbot, Plaice, Sole, and some others. This is one of the most peculiar and marked groups in the whole tribe of fishes—indeed, M. Cuvier says, in the whole series of vertebrated animals. As in the varieties of birds, we see them occupying different stations,—some feeding on the ground, others on trees, and several at various heights in the air,—so fishes are designed to inhabit many situations in the watery world, and most admirably is their form adapted for their intended residence. It is impossible here to overlook the same principle of design, the same absolute perfection in execution, which are so conspicuous in all the works of God, whether we regard Him in His sublimest productions, or observe those provisions He has made for the safety and well-being of these "His lowest works."

Like the rays and skates, the Flounders are meant to inhabit the bottom of the ocean; and, by their depressed form of body, they are peculiarly fitted to take the lowest position, where they occupy the smallest space among their kindred fishes. Their form is very deep, but at the same time very thin; and they are constituted to swim, not as others do, with the back uppermost, but on their sides, as expressed in the name given them, which is derived from two Greek words, signifying *the side* and *a swimmer.* They reside wholly upon the bottom, shuffling along, by waving their flattened bodies, almost surrounded by their large dorsal and anal fins. Being somewhat sluggish in their movements, and having little or no means of defence, they need concealment from enemies; and this is afforded them by the side which is uppermost being of a dusky-brown hue, undistinguishable from the mud on which they rest; and so conscious do they appear to be wherein their safety consists, that, when alarmed, they do not seek to escape by flight, as do other fishes, but sink down close to the bottom, where they lie perfectly motionless. So completely are they thus concealed, that even the experienced eye of the fisherman fails to detect them, and he is obliged to have recourse to another sense, tracing lines upon the mud with a pole, in order to discover by the touch the hidden fish.

The most singular and grotesque appearance is presented by these fishes, owing to the want of symmetry in their form,—both eyes placed on the same side, one higher than the other, and often unequal in size; the position of the mouth; the inequality of the two sides of the head; and the frequent want of uniformity in the size of the fins that are pairs, those on the under side being often smaller than those on the upper; and the colour being always confined to one side, while the other is entirely white;—all these particulars differ from the general rules observed in the formation of animals.

When we consider attentively the structure of the head, we find again a peculiar and very remarkable provision for the wants of the animal. "If the eyes were placed, as in all others, one on each side of the head, it is evident that the Flat-fishes, habitually grovelling in the manner described, would be deprived of the sight of one eye, which, being always buried in the mud, would be quite useless. To meet this difficulty, the spine is distorted, taking, near the head, a sudden twist to one side; and thus the two eyes are placed on the side which is kept uppermost, where both are available." With respect to the fins, also, the smaller pectoral and ventral fins on the under side are advantageous where there is less room for their action than in the case of the larger fins that are above.

Mr. Couch remarks, that all the Flat-fish have a very remarkable development of the iris; the upper and middle portion of the iris forming a rounded prolongation, which hangs as a curtain over the pupillary opening. He says:—"In some specimens it is more apparent than in others, depending upon the localities and depths of the water from which they have been taken. The iris in the *Pleuronectidæ*, as well as in the sharks and rays, has a distinct action. In the turbot, as well as in the sharks, I have, on many occasions, watched the movements and measured the pupillary opening. In the Rays, the curtain is very peculiar, being developed into a serrated festoon. This is so much the case, that the blind may be said to resemble a glove with spread fingers. This also varies in size, and has motion."

Most of the Flat-fish are deservedly in high estimation as food. The number of species diminishes as the degrees of northern latitude increase. In this country we have sixteen or eighteen species;* at the parallel of Jutland, Denmark, and the islands at the mouth of the Baltic, there are thirteen; on the coast of Norway they are reduced to ten species, at Iceland the number is but five, and at Greenland only three.

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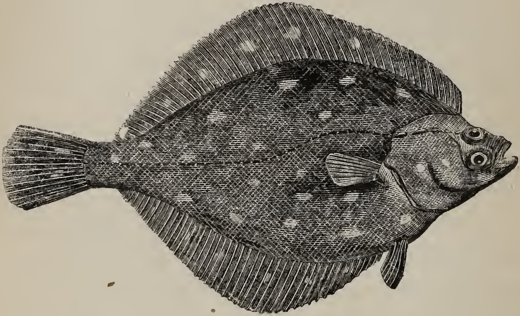
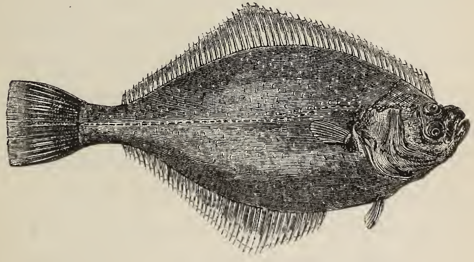
* They are—the Plaice, Flounder, Dab (3 species), Pole, Holibut, Turbot, Brill, Topknot (2 species), Whiff, Scaldfish, Sole (4 species).

The *Plaice* is a very common fish on most of our coasts, and well known to us all, with its brown colour marked with large bright orange spots. It inhabits sandy banks and muddy grounds in the sea,



PLAICE.

where it lives on the smaller and softer inhabitants of the ocean, such as molluscous animals or very young fishes, to which the smallness of its mouth and the structure of its teeth confine it. Occasionally it has been taken of the weight of fifteen pounds, but the average size is from six to seven pounds. This fish may always be recognised by a row of bony tubercles on the eye-side of the head. In some parts of Europe, the Plaice has been permanently transferred to fresh water, in which it has been found to flourish. It is taken occasionally in almost incredible numbers; and Mr. Yarrell mentions that so great a glut once occurred in Billingsgate market, that hundreds of bushels remained unsold. Great quantities of Plaice, averaging three pounds' weight each, were sold at one penny per dozen. One salesman, having vainly tried to dispose of a hundred bushels at the rate of fifty fish for fourpence, left them with the clerk of the market, requesting him to sell them for anything he could get. Unable to dispose of them at any price, he eventually, by direction of the Lord Mayor, divided them among the poor.



FLOUNDER

One of the most common of the Flat-fish is the *Flounder*, which inhabits every part of the British seas, and even frequents our rivers beyond the reach of the tide, thriving in salt, brackish, or fresh water. Its food is similar to that of the plaice, which it much resembles in its habits. The partiality of these fish for a mud bottom, has procured them the name of Mud-flounders, in some parts. In Scotland, they are known by the names of Fleuke, and Mayock-Fleuke—a term having reference to the flattened form of the fish. The Flounder is much smaller than the plaice, rarely attaining four pounds in weight; it is also more elongated in form, and has a row of sharp, denticulated tubercles, which surround its sides, and are placed along the base of the dorsal and anal fins. The general colour of the upper part is a pale brown, sometimes mottled with yellowish or brown spots. Varieties of the Flounder are very common. "I have before me, while I write, specimens without any colour on either side, specimens coloured on both sides, and specimens with both eyes and the whole of the colour on the left side, instead of the right. Those without any colour on either side, are *albino* varieties. The reversed specimens are so common, that it is scarcely possible to examine a peck measure of Flounders without finding one or more of them."* The Flounder is inferior in flavour to most of the tribe of Flat-fish.

Common on all sandy parts of the coast, and usually taken with the plaice and the flounder, the *Dab* is readily distinguished from either by its paler (light brown) colour, the abrupt and high arch of the dorsal line over the pectoral fins, and the roughness of its scaly surface, from which it has been called, in Latin, *limanda* (from *lima*, a file). It is also much smaller, averaging from six to nine inches in length. The Dab feeds on small crustacea and marine insects; and it is reckoned superior as food to either the plaice or flounder.

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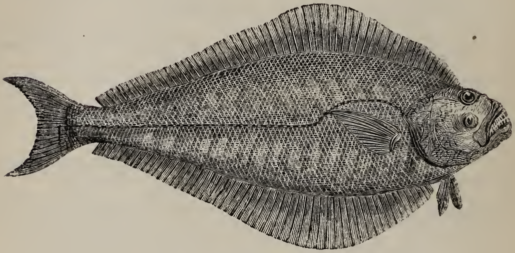
* Yarrell, *in loco.*

The *Lemon*, or *Smooth Dab*, is much less plentiful than the preceding; and, although pretty generally dispersed, is also so limited, that it must be ranked among the rarer of our Flat-fish. It is pretty in appearance, having a variety of reddish-brown and yellow colours. The body is smooth, and the head and mouth are very small. It has many names—Lemon Sole, Town Dab, Sand Fleuke, and Mary Sole.

Three rare kinds, called the *Long Rough Dab*, the *Pole Fluke* or *Pole Dab*, and the *Sandnecker* or *Long Fluke*, are also added to the list of British species by Mr. Yarrell.

One of the largest of the tribe is the *Holibut*, averaging from three to six feet in length. The eyes and the colour are on the right side; and the body is more elongated and smooth, tapering towards the tail, which is crescent-shaped. Its capture is principally confined to the northern fisheries; but it is not uncommon on some parts of our coasts, particularly those of Scotland and the eastern shores of England. It is well known on the Norwegian, Icelandic, and Greenland coasts, these northern latitudes being its proper abode. It is said to be very voracious, its long, sharp, curved teeth enabling it to devour prey of great size and strength. Occasionally it attains to very great size. The Greenlanders eat this fish, both fresh and dried; and a large quantity of oil is obtained from it: it is, however, coarse, and has little flavour. The prevalent hue is a dusky brown, frequently inclining to olive colour; the lower surface uniformly white and smooth.



HOLIBUT.

We come next to a fish of high renown; the best, as it is, also, one of the largest,* of our Flat-fish—the *Turbot.* So well known is this princely fish, that it needs no description. We are all acquainted with its nearly round form, and mottled yellowish-brown colours. Notwithstanding the immense numbers which are taken, these fish are still in great abundance on many parts of the British coast, and a considerable fishery for them is prosecuted in several parts. The coasts of Holland produce Turbot in immense quantities, and the fishery is carried on by the Dutch with great skill and success. The preference is given in the London market to those taken by the Dutch fishermen, who furnish about one-fourth of the whole supply. They are supposed to have derived not less than 80,000*l.* a-year from this traffic; and the Danes from 12,000*l.* to 15,000*l.* annually, for lobsters, taken from the rocky shores of Norway, and used as sauce for this fish.*

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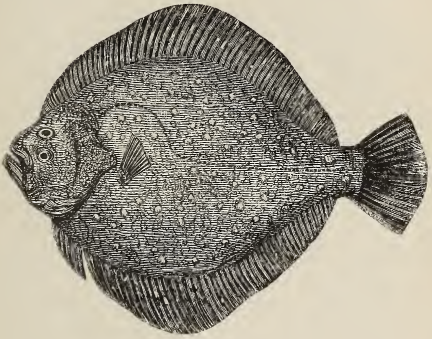
* The most common weight is from 5 to 10 lbs. Sometimes it attains 30 lbs.



TURBOT.

Individuals are occasionally found, having the eyes and dark colour on the right, instead of the left side, *i. e.* reversed specimens; and examples occasionally are seen having the colour on both sides. Some fishmongers recommend such fish as peculiarly excellent. With reference to the habits of the Turbot, Mr. Couch says it keeps in sandy ground, and is a great wanderer, usually in companies; and though its proper place is close to the bottom, it sometimes mounts aloft, and has been known to come to the surface over a depth of thirty fathoms. An instance is mentioned of one of these fish pursuing to the top a companion, which was drawn up by the line, when both were taken together. This last fact seems to give us a hint as to the possession of mutual attachment between these fish, whose habits are necessarily concealed from our view, dwelling, as they do, in the depths of the ocean, where eye of man cannot follow them. Oh! how true it is, that it has never entered into our thoughts to imagine the faculties and instincts of the myriad creatures with which God has replenished the mighty seas! Still less can we form any idea as to all the reasons for their creation. We know only thus much, "For Thy pleasure they are, and were created," oh Thou that "openest Thy hand, and satisfiest the desire of" them all. "The earth is full of Thy riches; so is this great and wide sea, wherein are things creeping innumerable, both small and great beasts."

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* The Turbot was well known to the Ancients. It is considered to have been the Rhombus of the Romans; a specimen of which is said to have been taken in the reign of Domitian, who ordered a *senatus consultum* to devise the best mode of bringing it to table, as Juvenal records in his Satires.

The *Brill,* or *Pearl,* is a well-known fish, very similar to the turbot, but smaller, and of a more oval form. It is frequently taken all along our coasts, in company with the turbot; but is very inferior to it in flavour.

The two species of *Topknot*, called "*Muller's Topknot,*" and "*Bloch's Topknot,*" are both somewhat rare; and being small, compared with most of their congeners, and their flesh soft and insipid, are but little esteemed by the fisherman. They resemble the brill in their roundish oval form; but in their choice of a locality differ from their kindred species, preferring low shelving rocks, covered with sea-weed, where they are not easily perceived, on account of the similarity between their colour and that of the weeds. In winter, the young, two or three inches long, are found by boys in pools, and under stones, at low-water mark.

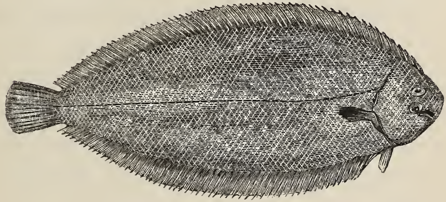
The two remaining species belonging to the turbot group, differ greatly from the rest, in their general form and appearance. The body is long and very narrow, compared to the length, suddenly contracted before the tail, and so thin as to be somewhat transparent.

The *Whiff* is a fish but little known; it seems to occur more frequently on the Cornish coasts than in any other part. It is called by the fishermen there, the Carter. It keeps on sandy ground, not far from land, and is often caught, but little valued, from being so thin.

The *Scaldfish* is one of the smallest of the British Flat-fishes; its length not exceeding five or six inches. It is exclusively confined to the southern coast, and is called there *Megrim.* Mr. Couch says it is never known to take a bait, but is often caught in the trawls, and always presents the appearance of having been dipt in scalding water, whence its name "Scald-fish." The scales are very thin, and easily removed by friction.

The shape of the *Soles* is not unlike that of the two preceding species, being oblong oval; but the body is thick and plump. The eyes and colour are on the right side, and the mouth is, so to speak, distorted or twisted to the side opposite the eyes. The snout is more rounded than in any of the preceding Flat-fish.

The *Common Sole* is so universally known and greatly prized, as to need little description. All the upper side of the body is dark brown, the scales edged with a deeper tint, causing a reticulated appearance; the pectoral fin is tipped with black. The under side is white; and about the nostril and mouth are numerous soft papillæ. This valuable fish inhabits the sandy shore around all our coasts, where it keeps close to the bottom, feeding on the eggs and fry of other fishes. It varies greatly, however, in numbers in different localities; being least frequent and smallest in the north. Many places on the eastern coasts of England supply it in large quantities; but the principal fisheries are on the south and west, where it is much larger, and reckoned finer in quality. It seems to have a very extensive geographical range, reaching northward, as far as the Baltic and the seas of Scandinavia, and southward, along the shores of Spain and the Mediterranean.



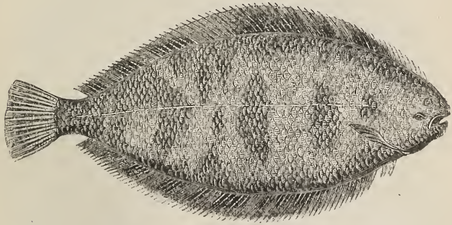
SOLE.

Soles are obtained almost entirely by trawling; as they seldom take a bait. The deeper the water in which they are caught, the finer is the quality of the fish. Sometimes very large specimens are taken, weighing so much as six or seven pounds; and one even is recorded which was twenty-six inches long, and weighed nine pounds. The principal trawling ground in England is along the south coast, from Sussex to Devonshire: and there are two great fishing stations at Brixham and Torbay; the boats used for the purpose ranging as far as the Land's End, and even to the Scilly Islands.

It has been found that Soles thrive well in fresh water. Mr. M'Culloch, in his papers on "Changing the Residence of certain Fishes, from Salt-water to Fresh" (given in the "Royal Institution Quarterly Journal," for 1824-25), says he was informed that a Sole had been kept in a fresh-water pond for many years; and adds, that in a pond at Guernsey, the Sole becomes twice as thick as a fish of the same length from the sea. A letter from a gentleman, residing on the banks of the Arun, contains the following statement:—"I succeeded yesterday in seeing the person who caught the Soles about which you inquire, and who has been in the constant habit of trawling for them in this river, for the last forty years. The season for taking them is from May till November. They breed in the Arun, frequenting it from the mouth, five miles upwards, which is nearly to the town of Arundel, and remain in it the whole year, burying themselves in the sand during the cold months. The fisherman has occasionally taken them of large size, two pounds' weight each, but frequently of one pound; and they are thicker in proportion than the Soles usually caught at sea; in other respects, precisely the same; and it is evident they breed in great numbers in the river, from the quantity of small ones, about two inches long, that are constantly brought on shore, when drawing the net for grey mullet."

Reversed Soles (*i. e.* having the colour on the left side, instead of the right) are not uncommon.

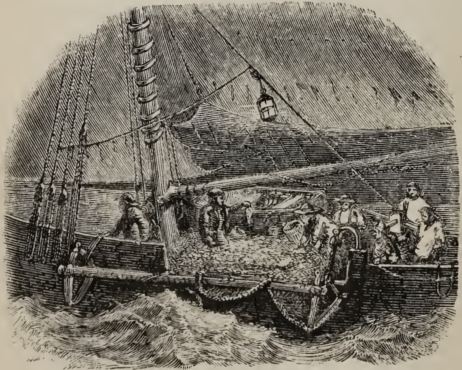
The *Lemon*, or *French Sole*, is a pretty little fish, with colours of orange and light brown, and freckled over with numerous small round brown spots. It is wider, in proportion, than the common Sole, but is much smaller; its length not exceeding ten or twelve inches. The under surface white, and the head without the papillæ, so remarkable in the preceding species. It was first discovered by Mr. Yarrell, at Brighton, where it is said to be occasionally taken, with the common Sole, when trawling over a clear bottom of soft sand; and as this happens most frequently in the direction of the French coast, the fishermen sometimes call it the French Sole.



VARIEGATED SOLE.

Very much resembling the common Sole, but remarkably distinguished by the small size of the pectoral fins, is the *Variegated Sole*, a small fish scarcely attaining half-a-foot in length; the colour of the surface being a very light brown, tinged with red, clouded with darker shades; the scales large, and rough to the touch. It is a rare species.

The *Sölenette*, or *Little Sole*, seldom exceeds the length of five inches. It is not unfrequently taken in the trawl nets, by the fishermen on the Devonshire coast; but, on account of its diminutive size, is seldom brought on shore. It has been confounded with the variegated; but may at once be distinguished by the tapering of the body towards the tail, and, more particularly, by the union of the dorsal and anal fins to the base of the tail, while the variegated Sole has the tail separated from them by a considerable interval.

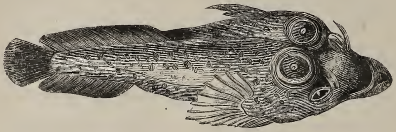


TRAWLING IN THE NORTH SEA.

CHAPTER XII.

THE FAMILY OF THE SUCKERS. (Cyclopteridæ.)

We come next to a family of Fishes, few in number, most of the species of comparatively small size, and not valuable as food; but interesting to the naturalist from the very striking peculiarity of their structure, as well as in other respects. This is the *Family of the Suckers* (Cyclopteridæ); so named on account of the remarkable adhesive apparatus with which they are furnished, and by means of which they are able to retain their place in a strong current of water, being protected and supported by fastening themselves to stones and other bodies. The pectoral fins in these fishes are very much extended beneath, and surround a circular disk, which acts as a sucker. The two British species belonging to the first genus of this tribe, the *Cornish Sucker* and the *Bimaculated Sucker*, are small and defenceless, their bodies smooth and without scales. The former does not usually exceed two inches and a half in length. It is prettily marked, being of a pale flesh colour, with spots and patches of carmine, and on the nape, behind the eyes, are two conspicuous eye-like spots, of deep red or purple. It is found in Cornwall, and is there called pre-eminently the Sucking Fish by the fishermen, from the readiness with which it adheres to any substance, and even to the hand that seizes it.

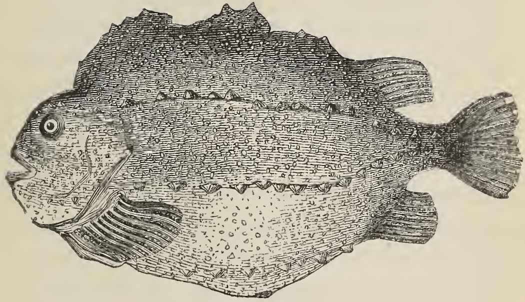


CORNISH SUCKER.

"It is sluggish in its habits, but seems to wander, since it is sometimes much more frequent than at others. Its usual haunts are about low-water mark, where it is often left by the tide, adhering to stones." Its food is crustaceous animals and marine insects.

The *Bimaculated Sucker* resembles the former; but is smaller and the head more depressed, and the body more tapering. It is so called from two marks on the sides, which, however, are not always obvious. The prevailing colour is a fine red; the under side flesh-coloured. It is obtained by deep dredging, and adheres to stones and old shells. When placed in a glass of sea-water, these little creatures have been seen to fasten themselves to the sides of the vessel by means of the sucker, and so continue till they died. "Even after death, the power of adhesion continues, and the wet finger being applied to the part, the fish becomes suspended. When alive, they instantly attach themselves to the hand, if taken out of the water."

The *Lump Sucker* is remarkable for its very grotesque form. It is from eighteen inches to two feet in length, the shape of the body being like that of the bream. Its great depth and thickness give it a clumsy look, and the very fleshy or fat appearance being continued even to the small mouth, surrounded by its full cheeks, cause it somewhat to resemble an overfed, self-satisfied glutton. The back rises into a sharp, prominent ridge (improperly called a fin), and this has given rise to the epithet of "Cock-paddle," frequently bestowed on this fish. Behind this prominence is the dorsal fin, and on the belly is another of the same form answering to it. The pectoral fins are large and broad, almost uniting



LUMP SUCKER.

at their base, and beneath them is the part by which the animal adheres to the rocks.

The Lump Fish is extensively distributed, especially in the northern seas, and it is frequent on our own coasts, appearing at times in multitudes, during the spring, when it approaches the shore to deposit its spawn. The male fish is much smaller than the female, nearly one-half, and at the breeding season becomes very gaudy in hue, the colours combining various shades of blue, purple, and rich orange-red. It is frequently to be seen at this time in the shops of the London fishmongers, suspended by the middle of the back, attracting attention from its singular form and brilliant tints. These fine shades speedily fade away, and the quality of the flesh deteriorates. So great is the difference that our fishermen consider them to be different species, and call them the Red Lump and the Blue Lump; but in reality the difference in colour and flavour is only the effect of the season. The power of adhesion by means of the ventral disk is very great. One of our naturalists says, "On placing a fish of this species just caught into a pail of water, it fixed itself so firmly to the bottom that, on taking it by the tail, the whole pail was by that means lifted, though it held some gallons, and that without removing the fish from its hold."

It is not uncommon on the Cornish coasts, and in its habits is said to be very inactive, adhering very tenaciously to the rocks or stones, from which it rarely moves except for the purpose of feeding. It lives principally on young fish, of which it devours a large quantity. The Lump is taken in the Greenland seas, where it is eaten, and the roe, which is remarkably large, and of a fine orange colour, is boiled by the Greenlanders to a pulp and eaten.

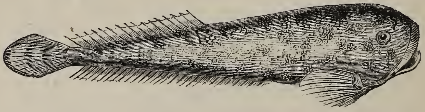
It has been noticed, in the Introductory Chapter to this little volume, that Fabricius, the great Danish naturalist, makes mention of the parental attachment evinced by the Lump Fish for its young. He says that the male takes charge of the eggs, and courageously guards them, so that, even if driven away by man, he will not remove far, but speedily returns, and in case of attack from any other fish he fastens himself to the neck of his adversary, to which he adheres tenaciously, and, despite his apparent want of deadly weapons, is capable thus of inflicting a mortal wound. Dr. Johnston also states, in addition, that the young, soon after birth, are seen to attach themselves, by means of their suckers, to the sides and backs of the parent fish, who, thus loaded, sails away, bearing them off to deeper waters and more secure retreats.

Surely a more extensive acquaintance with these dwellers in the watery world would bring to light unsuspected points of great beauty in their history;

and afford proofs of a higher degree of intelligence and interest than we have been accustomed to give them credit for. Could one attain to the knowledge of them fundamentally, not merely in regard to their external form, their scales, fins, and the like, but also discover the nature, properties, emigrations, and instincts of every species, then indeed (as the excellent Crantz observes) the *historia naturalis piscium* would be practical, and the groundless allegations of the ancients would be superseded by something more genuine and convincing. Happily, every day is bringing to light additional stores of true knowledge.

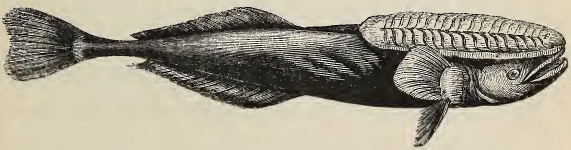
And here I hope I may be excused for making a digression. It is somewhat noticeable, that, just as I am writing these lines, my attention has been directed to a paper in the *Illustrated London News*, for March 20, 1858, containing a most striking illustration of parental attachment in fish, which was witnessed by a sportsman in the waters of the celebrated American Lake George. The account of the incident is given in these words:—"The idea having occurred to us of spearing a few fish by torchlight, we secured the services of an experienced fisherman, and with a boat well supplied with fat pine we launched ourselves on the quiet waters of the lake, about an hour after sundown. Basse (a species peculiar to America, called the Black Basse) were very abundant, and we succeeded in killing some half-dozen of a large size. We found them exceedingly tame, and noticed that when we approached they were invariably alone, occupying the centre of a circular and sandy place, among the rocks and stones. We inquired the cause of this, and were told that it was the spawning season, and that the circular places were the beds in which the young were protected. On hearing this, our conscience was somewhat troubled for what we had been doing, but we resolved to take one more fish and then go home. We now came to a large bed, around the edge of which we discovered a number of very small fish; and over the centre of the bed a very large and handsome basse was hovering. We darted our spear and only wounded the poor fish; our companion told us that, if we would only go away for fifteen minutes, and then return to the same spot, we should have another chance at the same fish. We did so, and the prediction was realized. We threw the spear again, and again missed our game, though we succeeded in nearly cutting the fish in two. 'You will have the creature yet; let us go away again,' said our companion. We did so; and lo! to our utter astonishment, we saw the fish, all mutilated and torn, still hovering over its tender offspring. To relieve it from its pain, we darted the spear once more, and the Basse lay in our boat quite dead; and we returned to our lodging that night decidedly unhappy. The parental affection of that fish for its helpless offspring, which it protected even unto death, has ever seemed to us in strict keeping with the loveliness and holiness of universal nature."

The Unctuous Sucker, or *Sea Snail*, is so called from the soft and slimy texture of its body. It is almost transparent, and soon dissolves and melts away when taken out of the water. It is common in many parts of the coast, and specially near the mouths of rivers. The length is from four to six inches; it is of a pale brown colour, irregularly striped, with lines of a darker shade, giving it a variegated appearance. *Montagu's Sucker*, or the *Diminutive Sucking Fish*, is a very small species, inhabiting the rocky parts of the coast. Unlike the others of the genus, it is rather active, and rarely makes use of its sucker, unless in a stream, or anything that seems likely to push it aside. It seldom exceeds three inches in length, and is of a dull orange colour varied with bluish tints. When adhering to any object, it has the habit of curving the tail forward towards the head.



MONTAGU'S SUCKER.

In the fishes we have been now considering, the adhesive disk is placed on the lower part of the body; but in the very singular family of the Remora Suckers, this apparatus is placed on the crown of the head, in the form of a large oval shield, by means of which the animals are able to attach themselves firmly to the surface of other fishes, or the bottoms of vessels; but whether for protection, or conveyance, or both, is a question which has not been satisfactorily ascertained. Only a solitary individual of one species belonging to this family has been obtained in our seas—the *Common Remora*, taken at Swansea, on the back of a cod-fish, in the summer of 1806. This is a Mediterranean species, with which the Greeks and Romans were well acquainted, and about which many fabulous accounts of its extraordinary powers in attaching itself to ships and instantly arresting their course, are given in the pages of Aristotle and others.



REMORA.

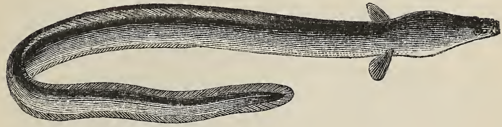
Here we take our leave of this singular tribe of fishes, with their unique and peculiar structure, enabling them to cleave like the limpet to the storm-defying rock for safety. There is recalled to my mind, at the moment, a very touching expression used by a poor Greenland woman, in the near prospect of death. Her body, she said, was decayed by sickness, but the grace conferred on her by the Lord Jesus was inexpressibly sweet. "We cannot see Him," she added, "with our bodily eyes; but our hearts can feel His presence, if we love Him and cleave to Him, as the augmarset to the rocks."

How sweet the lessons which may be drawn from the birds of the air, or the fishes of the sea, if the heart be but possessed with the love of Christ!

The Family of the *Murœnidœ*, or *Eel-shaped Fishes*, next in succession, constitutes a distinct order called *Apodal*, because these fishes are destitute of ventral fins. When we say that our common Eel is the most characteristic representative of the family, nothing more is necessary to convey an idea of the general appearance of the tribe. According to the observations of recent naturalists, there are three or four distinct species of the fresh-water Eel inhabiting this country, and which had previously been confounded together. The difference consists chiefly in the form of the head and the colours of the body.

The *Common*, or *Sharp-nosed Eel*, inhabits all the fresh waters of our islands, abounds throughout

Europe (except in the Arctic regions, and in some of those rivers which have their source in very cold districts), is found in Asia also, and, in short, in almost every part of the world. It is, strictly speaking, a fresh-water fish, and many undoubtedly remain all



COMMON EEL.

the year in ponds and breed there; but, when following its natural instinct, it migrates towards the sea in autumn, and lives in brackish water at the mouths of rivers. As it is well known that these fish are extremely averse to cold, it seems probable they seek the mixed water during the winter months, because of the higher temperature which results from the mixture of two fluids of different density. The brackish water in the mouths of rivers that run into the sea is about two degrees warmer than the purely salt or purely fresh element. There seems little doubt that the existence of this higher degree of temperature is one reason why such situations abound in young fish.

"Most of the writers on the habits of the Eel have described them as making two migrations in each year; one in the autumn, *to* the sea, the other in spring, *from* the sea. The autumn migration is performed by adult Eels, and is believed to be for the purpose of depositing their spawn; it is also said that these parent fish never return up the rivers. The spring migration is commonly supposed to be confined to very small Eels, not more than three inches in length, and in reference to the fry alone, it is too well known, and too often recorded, to be matter of doubt. The passage of countless hundreds of young Eels has been seen and described as occurring in the Thames,* the Severn, the Parrett, the Dee, and the Ban. I am of opinion, however, that the passage of adult Eels to the sea, or rather brackish-water of the estuary, is an exercise of choice, and not a matter of necessity, and that the parent Eels return up the river, as well as the fry."

Various methods are resorted to to intercept these fish while they are on their autumnal migrations. The apparatus used on the Thames, called an Eelbuck (of which a figure is here given), consists of a number of wicker baskets, of a peculiar form, supported on a wooden frame-work. The large open end of each basket is opposed to the stream, and, by the peculiar construction of the inside, a fish, having once entered, cannot escape again.

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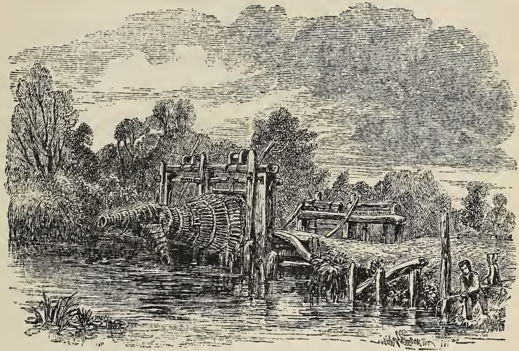
* "This passage of young Eels is called eel-*fare,* on the banks of the Thames, a Saxon word, meaning to go, pass, or travel (as we say, a 'wayfaring man,' 'a thoroughfare,' &c.) I have little doubt that the term *elvere* (a name for a young eel) is a modification of eel-fare."—YARRELL.



EELBUCK.

The London market is principally supplied from Holland; the Eels being brought over in Dutch vessels, which may be constantly seen lying off Billingsgate. "Eels and salmon," says Mr. Yarrell, "are the only fish sold by the pound weight in the London market." The rambling spirit of Eels seems to have been known to the ancients, for Oppian sings—

> "The wandering Eel
> Oft to the neighbouring beach will silent steal."

There is no doubt, indeed, that they occasionally quit the water, and travel during the night, over the moist meadows, in search of frogs, snails, and other food, or to change their situation. They also have been seen ascending rocks, and flood-gates, or posts of water-works, which have intercepted their progress. There is little doubt they are assisted in doing so by the small scales with which they are covered, and which, placed like those of serpents, seem adapted to facilitate their progressive motion. Mr. Couch says, "I have kept Eels in confinement, in large basins, but they have generally effected their escape by night, which is their favourite time for moving. Their manner of doing so is remarkable. They commence by throwing the tail over the edge of the vessel, and that organ being a prehensile one, they then lift themselves over, and so escape by their usual tortuous motion. The tail is a very powerful organ with all the Eels, and, in fact, with all fish that burrow in the sand or mud."

The winter retreat of Eels is very curious. During the cold season they remain imbedded in mud, and are often found knotted together in a large mass. In this condition they are frequently speared, or dug out in heaps.

It is now proved beyond doubt that Eels produce their young like other trúe bony fishes, *i. e.* they are oviparous.

These fish are often kept in ponds, and become comparatively tame, but they are so voracious as to be greatly dreaded, in consequence of their destructiveness to young fish and spawn. They will even attack large carp, seizing them by the fins, although unable to overcome them. Occasionally they eat vegetable substances, and may be seen cropping the leaves of small aquatic plants. Their tenacity of life is well known, and the facility they have, owing to the supple and slimy nature of their bodies, of gliding through the hands—"Slippery as an Eel"—is a proverb in everybody's mouth.

Eels are not only numerous, but also in great request in many countries. Mr. Ellis, in his Polynesian Researches, says that, in Otaheite, they are great favourites, and are tamed and fed until they attain an enormous size. These pets were kept in large holes, two or three feet deep, partially filled with water. On the sides of these holes they generally remained, excepting when called by the person who fed them. Mr. Ellis several times saw the young chief seat himself by the side of the hole, and by uttering a shrill sort of whistle bring out an enormous Eel, which would move about the surface of the water, and eat with confidence out of its master's hands.

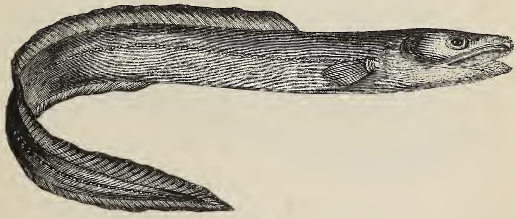
Eels vary very much in size; very often they grow to a length of five or six feet, and weigh as much as twenty pounds. They seem to be very long lived, and are slow of growth. The difficulty of killing them is well known, and for the sake of humanity it may be well to mention, that the quickest and best way of putting these creatures out of pain, is to immerse them in water of 120 degrees.

It is mentioned, in Griffith's edition of Cuvier's Règne Animal, that the skin of Eels, which has a consistency resembling parchment, forms the object of a small trade in some great cities. In Tartary, it is used, after being oiled, as a substitute for glass in windows, and the peasantry in some parts wear it round the arm or finger as a cure for rheumatism.

The *Broad-nosed Eel* is almost as common a species as the preceding. Its habits appear to be the same; it differs in the shape of the head, which is much broader, the nose blunter, and the skin thicker. This is the variety called the Grig, or Glut. The fishermen distinguish it readily in the dark, by its more soft and unctuous feeling in the hand. It rarely exceeds five pounds in weight.

The *Snig Eel* is another species, first distinguished by Mr. Yarrell, who procured it from the Avon, in Hampshire, where this Eel, rather remarkable for its yellow colour, is considered distinct from the common sorts. There are some differences in its external formation and habits, as well as in the size and character of the bones. It differs from the others also in roving and feeding during the day-time, which they do not. It is considered excellent as food, but does not attain a large size, seldom exceeding more than half-a-pound in weight.

The *Conger Eel* is entirely a marine species, and well known on all the rocky parts of our shores, but nowhere more abundant than on the coast of Cornwall, where the principal fishery for Congers is carried on. According to Mr. Couch, these fish prefer deep water, with a rough and rocky bottom. They feed chiefly by night, and prefer the darkest. They devour great quantities of large crustacea, which their powerful jaws enable them to crush; and prey upon the smaller kinds of fish, pilchard, cuttle, &c., and even on the young of their own species. They retire to hollows and crevices of the rocks, and burrow in the sand, in which hiding-places they are sometimes left by the receding tide. The numbers taken are immense; a single boat sometimes landing several hundredweight at a time, and though not held in much esteem, they are always saleable at a


CONGER EEL.

low price, being chiefly purchased by the poorer classes. Formerly a very considerable number were dried in a particular manner, and exported to Spain. Congers acquire a very large size; specimens weighing more than one hundred pounds have been taken, more than ten feet in length; but the average size is from five to seven feet long. They are very strong, and often prove formidable when assailed among the rocks, or drawn by the line into a boat. The colour is usually darker than that of the Common Eel, and the eyes much larger in proportion. The lower jaw is rather shorter than the upper, and they have more bones than our fresh-water species. The dorsal and anal fins are fringed with black. The gigantic spiny lobsters of the Mediterranean are said to enter into combat occasionally with the Conger, and generally come off victorious, by tearing the fish with their claws.

Belonging to this family, is one of the rarest visitors to our shores; indeed, only one specimen is known to have been taken in Britain. This is the *Murœna*, common in almost every part of the Mediterranean, and a great favourite with the ancient Romans, who preserved them in their numerous vivaria, where they fed them with great care. On the celebration of one of his triumphs, it is said that Cæsar distributed six thousand specimens of this fish among his friends.

This singular and beautifully-marked species has no pectoral fins; it resembles a gorgeously coloured serpent, the ground colour being a lively yellow, marked with rich purple. It is interspersed with innumerable spots of light and deep yellow, golden brown, and purple; altogether a most beautiful arrangement. The ordinary length is between three and four feet; it is strong, and difficult to capture, being fished for with lines. The flesh is said to be delicately white and of very good flavour. It is exceedingly voracious, bites severely, and can live a long time out of water.

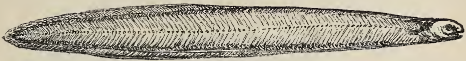
MURÆNA

The remaining genera belonging to the Eel family may be regarded as forming a section by themselves, differing in many points from those already described. They shall be reserved for the next chapter.

CHAPTER XIII.

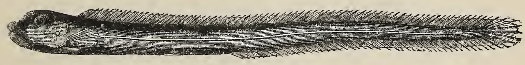
CONTINUATION OF THE MURÆNIDÆ.

The remaining species of the Eel family yet to be noticed are, the *Anglesea Morris,* a small riband-shaped fish, of extremely delicate texture, being semi-transparent. It is about five or six inches long, and in thickness does not exceed the sixteenth part of an inch. It is regarded as a rare visitant; but Mr. Couch says, that off the Cornish coast it is taken so frequently that it cannot be uncommon in deep water. An interesting account of it, with a good figure, is given in the sixth volume of the "Magazine of Natural History," by Mr. Deere, who states that a specimen, to all appearance dead, was brought to him by a Devonshire fisherman, who had carried it in his pocket, wrapped in brown paper, for three hours. After this gentleman had held the fish in his hand for about a minute, examining it, symptoms of life appeared; and then the little animal was placed in a tumbler of salt and water, where it survived for several hours. Its appearance is described as most pleasing, from its semi-transparent and silvery hue, its prominent eye (the iris of deep Prussian blue), and graceful motions. It is usually found entangled among sea-weed. Here is a copy of the figure referred to—



ANGLESEA MORRIS.

A very rare fish is the *Beardless Ophidium;* in shape not unlike the Red-Band Fish; the length about three inches.



BEARDLESS OPHIDIUM.

There are two species of the *Sand Eel,* or *Launce,* the one much rarer than the other; this is the *Wide-mouthed Launce Flornel,* or *Sand Eel,* which is much the larger of the two, measuring from ten to fifteen inches. The head is also much longer, and particularly the lower jaw. The habits of the two species are very similar. By means of the horn-like elongation of the under-jaw they are enabled to scoop their way into the wet sand of the sea-shore, where they take refuge from the voracious fishes which pursue their glittering shoals. The generic term (Ammodytes) refers to this power of digging into the sand.

The *Small-mouthed,* or *Sand Launce* is a well-known fish, very abundant on almost all the shores of Great Britain and Ireland. It is much smaller than the former species, seldom exceeding seven or eight inches. On account of its silvery brightness it is in great estimation and constant use with fishermen as baits for their lines. With the projecting under-jaw, aided by the muscular power of the fish, and its slender form, it is enabled to bury itself very rapidly, five or six inches deep in the soft sand as the sea retires, and then releases itself again on the return of the flood-tide, apparently quite uninjured, although it has been out of water for some hours. Mr. Couch says, "It is common to see in little companies, moving along near the surface, one much larger than the others, which seems to act as captain, and leads the advance." On the sands at Portobello, near Edinburgh, and in other places, people take advantage of this well-known habit, and, when it is discovered that a shoal of Sand Eels have hidden themselves in the sand, they sally out, armed with spades, shovels, rakes, and forks, and dig them out. When extricated from their sandy beds, the fish leap about with singular agility, and afford much sport to

SAND EEL.

the younger folk in capturing them. When taken, they are frequently used as food, and are said to be well-flavoured. At times they are carried to the Edinburgh market, and sold by measure. "It is only of late," says Mr. Couch, "that naturalists have learned to recognise two species, though it has been done long since by fishermen, who have been accustomed to observe that a small species, which keeps in larger bodies, and seldom goes far from land, is more followed by mackerel than the others, and that its presence is a better sign of good fishing. On a calm evening it is an interesting sight to see the surface of the water broken by the repeated plunges of these fishes, as they burst upon the little schull of Launces from beneath. Their only certain place of refuge from these pursuers is the sand." The food of the Sand Launce is marine worms and very small fishes.

The *Fifth Order of Bony Fishes* is distinguished by having the gills disposed in small rounded tufts; from which peculiarity the species belonging to it are called *Lophobranchii*, *i. e.* tuft-gilled. There is but one Family, viz:—

The *Family of the Pipe-Fishes.*—(Syngnathidæ.) These fish have a very remarkable appearance; the body being long and very slender, and the jaws united, and forming a cylindrical tube, the whole covered with bony plates, like a coat of mail. The arrangement of these plates is such as to render the body angular, but they do not interfere materially with its flexibility. They are not unfrequently called Needle-Fish. But the most remarkable peculiarity is the existence, in one genus, of a marsupial pouch, in which the young are contained. Reference has already been made (see Introductory Chapter) to this unique conformation, presenting, as it does, a curious counterpart to the pouch-bearing quadrupeds. This receptacle is found only in the male Pipe-Fish, which is furnished with two soft flaps, that fold together and form a bag or apron, in which the eggs are placed and matured, and the young hatched.

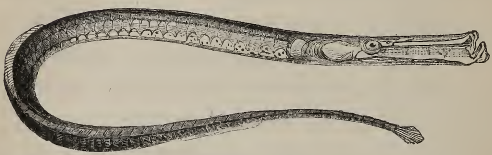
The *Great Pipe-Fish* is one of the most common species, and is found on many parts of the coast, sometimes at low-water, among sea-weeds, and at other times in deep water. It attains a length of between twelve and sixteen inches in this country, but in the Mediterranean and elsewhere is much larger. Mr. Couch says it may be seen swimming about slowly, in a singular manner, horizontally or perpendicularly, with the head downwards or upwards, and in every attitude of contortion, in search of its food, which seems to consist chiefly of marine insects.

M. Risso notices the great attachment shown by these creatures to their young, and it appears that the pouch forms a place of shelter, to which the little ones retreat in case of alarm. "I have been assured by fishermen that when the young were shaken out of the pouch into the water, over the side of the boat, they did not swim away, but when the parent fish was held in the water in a favourable position the young were seen again to enter their retreat."

It is believed these fish are able, by dilating their throats at pleasure, to draw their food up their long, cylindrical, beak-like mouths, as water is drawn up the pipe of a syringe. In common with all the others belonging to this family, this fish is of no use either as food or bait, its dry rigid body being much like a piece of wood, and as M. Cuvier says, "almost without flesh." The osseous plates which cover the body are about sixty-three in number, all of them beautifully striated. The prevailing colour is pale brown, transversely barred with darker brown. In the head and tail of the Great Pipe-Fish, the operculum is large, and shaped nearly like a mussel-shell, the surface marked with radiating lines. The tail is rounded at the extremity, very like a half-spread fan.

The *Deep-nosed* or *Lesser Pipe-Fish* is immediately distinguished from the preceding species by the breadth of the snout. Its habits appear to be the same, and it is almost as abundant.

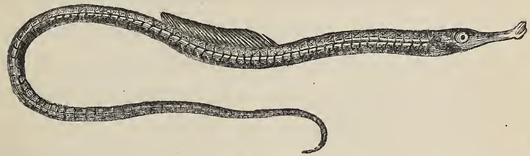
The species next to be noticed belong to a different group in the same family, and differ from the former in having a dorsal fin only,—no pectoral, ventral, or anal fin, and no abdominal pouch in either sex. They are much more slender and worm-like in shape. There is a great difference in the motions and changes of position observable in this genus. The Marsupials, which (as we have seen) possess a stiff short tail, provided with a fin, swim, like other fish, chiefly by the help of strokes of the tail; while the Ophidial Pipe-Fish, as they are called, have a long, roundish, tapering, and very flexible tail, which is generally kept still when swimming, and may be regarded as a helm rather than an oar. The creature entwines this supple tail with great dexterity around any object that may be at hand, and may be always seen holding fast in this manner whenever any convenient thing presents itself; but when no such support is near to serve the purpose, several individuals placed in the same vessel will entwine their tails together, and thus form concatenated groups, united in this strange fashion.



DEEP-NOSED PIPE-FISH.

The *Equoreal Pipe-Fish* appears to be very rare. The Cornish fishermen report that they have seen it far out at sea, swimming at the surface, over a great depth.

The *Snake Pipe-Fish* well deserves the name *Ophidian* (*i. e.* snake-like). It is much rounder and more slender than the former, its body scarcely exceeding the thickness of a goose-quill, and it has a remarkably long, narrow tail.



SNAKE PIPE-FISH.

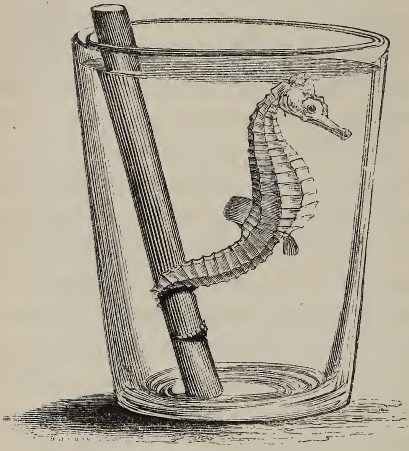
Although destitute of the abdominal pouch, there is provision made in this genus for the performance of a function similar to that which is executed by the Marsupial fishes. It appears that the eggs are carried, for a time, by the male parent fish, in small cells or depressions which exist on the surface of the abdomen. Mr. Yarrell says that he found specimens, taken in August, which contained one egg, of the size and colour of a mustard-seed, lodged in each cup-like cell. The females were not provided with these receptacles.

The *Worm Pipe-Fish* is the smallest of the British species, and is taken on various parts of the coast. It does not exceed five or five and a half inches in length. It has no fin, except a small one on the back.

The nose is very short, and turned upwards. The colour of the body, like that of the preceding species, is olive-green. "It seems to pass through a kind of metamorphosis when young; the whole of the tail, when it escapes from the egg, being enveloped in a thin membrane, and small pectoral fins are visible; both of which, after a time, disappear." Hence, it should seem that these fish undergo something of the same process as tadpoles. It is worthy of note, that the delicate young *syngnathi* are, perhaps, of all creatures the best suited for microscopical observations on the circulation of the blood.

The next genus of this family is *Hippocampus*, defined by M. Cuvier as having the trunk laterally compressed, and much more elevated than the tail. When the body curls up after death, the upper parts have some resemblance to the head and neck of a horse in miniature, whence has arisen the English name, "Sea-horse." The species are not numerous, but they are found in some parts of the Continent in considerable numbers, and are often kept in cabinets of natural curiosities, in a dry state, owing to the singularity of their form. Their structure renders them very easy of preservation; and, indeed, they may be readily examined, either dead or alive, without its being conjectured, by an unlearned observer, that they belong to the class of fishes. Probably my readers are acquainted with them, in their mummified condition, as curiosities kept with shells and marine productions.

There is only one British species, the *Short-nosed Hippocampus*, and that is very rare, only a few specimens having been found occasionally, chiefly in the south of England; but there can be no doubt that at least one species has been occasionally met with on our coast, and at Guernsey, and the other Channel Islands. The most interesting account of this little animal is given by Mr. Yarrell, as communicated to him by Mr. Lukis, of Jersey, who, in June, 1835, had two female specimens of them, alive and healthy. "They have been living," says this gentleman, "twelve days in a glass vessel, their actions equally novel and amusing." Seeing them apparently in search of a resting-place, he put some sea-weed and straws into the vessel, and they quickly availed themselves of these objects, turning around the weeds, and fixing themselves firmly; then watching the surrounding objects, and darting at their prey with great dexterity. Now and then they would approach each other, and often twist their tails together, and struggle to separate, or attach themselves to the weeds. This was done by the under part of the cheek or chin, which was also used for raising the body, when a new support was wanted around which to fasten the tail afresh. The eyes moved independently of each other, as in the chameleon; and this peculiarity, together with the brilliant changeable iridiscence about the head, and its blue bands, forcibly reminded the observer of that animal. Mr. Lukis says, "Few inmates of the deep have displayed, *in prison*, more sport or more intelligence."



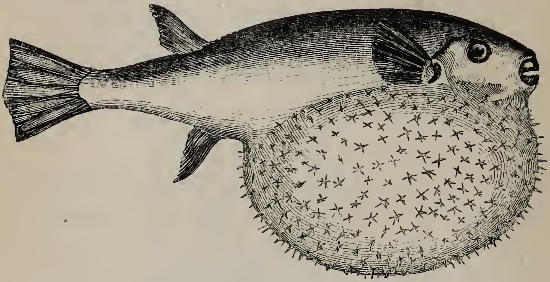
HIPPOCAMPUS.

More than one specimen of Hippocampus has been found coiled up in oyster-shells. One taken at Harwich lived in confinement three weeks; it was described as swimming with great ease and an undulatory motion, very interesting to observe. This genus is found to resemble the *syngnathi* in their peculiar structure. The male fish are provided with the pouch; the female has a small anal fin of four rays, but no true pouch. Mr. Yarrell conjectures that, as this fin is peculiar to the female only, it probably performs some office at the time of transferring the eggs into the pouch of the male. "The general colour is a pale ash-brown, relieved by a changeable iridiscence and variable tints of blue, dispersed over different parts of the head, body, and tail." The length is about five inches.

In the next order of fishes, the *Plectognathi* (or fishes with soldered jaws), we discern an approach to the great tribe of cartilaginous fishes, the skeleton, although still chiefly bony, being partly of cartilage. The principal distinctive character consists in the bones of the jaw being firmly joined together, and the arch of the palate united to the skull.

Of the *Family with naked teeth* (*Gymnodontidæ*), we have but two British genera. Of the first of these, the species are, properly speaking, tropical; and the only one that has occurred on our coasts is named by Mr. Yarrell—

Pennant's Globe-Fish, it having been first discovered by that naturalist. In the absence of true teeth, the partially exposed jaws are divided in the middle by a groove, thus giving the appearance of four teeth. "The species are remarkable for being provided with the means of suddenly assuming a globular form, by swallowing air, which, passing into the crop, or first stomach, blows up the whole animal like a balloon. The abdominal region being thus rendered the lightest, the body turns over, the stomach being the uppermost part, and the fish floats upon its back without having the power of directing itself during this state of forced distention. But it is while thus bloated and passive, at the mercy of the waves, that this animal is really most secure; for the numerous spines with which the surface of the body is universally beset are raised and erected by the stretching out of the skin, thus presenting an armed front to the enemy on whatever side he may venture to begin the attack." The body is usually oblong, and it is only when alarmed that the fish has recourse to this strange mode of self-defence. After filling this crop-like expansion with air and water, it expels them by degrees from the branchial openings and

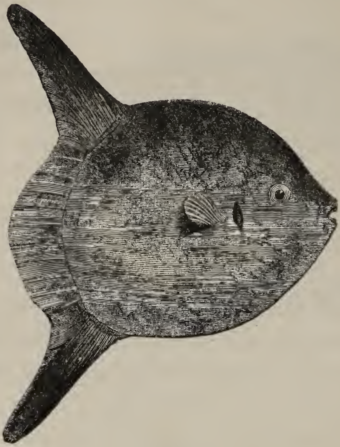


PENNANT'S GLOBE-FISH.

mouth with considerable force, making a pretty loud noise. Mr. Darwin, in the "Voyages of the *Adventure* and *Beagle*," describes this fish, and says that, when handled, it emitted from the skin of its belly a most beautiful carmine-red and fibrous secretion, which stained ivory and paper in so permanent a manner, that the hue is retained in all its brightness to the present day. The length of the specimen described by Pennant was about a foot and a half; the back rich blue, the belly and sides silvery white, the fins and tail brown. Several of the species are believed to be poisonous.

The other genus belonging to this family is very remarkable and conspicuous in form and appearance. Two species are found in our seas, one of them not very scarce, the other exceedingly so.

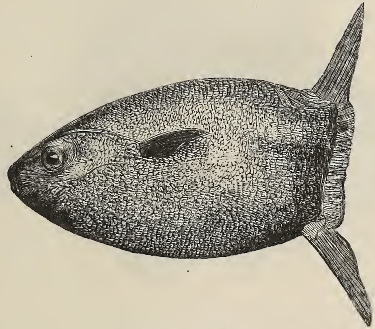
The *Short Sun-Fish*, so called from its almost circular form, and bright, shining appearance when first taken out of the water, though but occasionally taken, has been met with at intervals upon various parts of the British coasts. When noticed, they have usually appeared as though dead or dying, and floating on one side, the broad surface of the other side being presented to view. In this seemingly dormant state they may be lifted into a boat, almost without making any effort in self-defence. The specimens have varied in length from fourteen inches to three or four feet, and in weight from fifty to four hundred pounds. In fact, both species grow to a large size, and, as has been remarked, they look more like the dissevered head of a fish than the entire animal. They are said to exhibit a high degree of phosphorescence. Mr. Couch says, the Short Sun-Fish is migratory, keeping probably at the bottom, and feeding on sea-weeds, in its ordinary habits; but in calm weather it mounts to the surface, and lies, perhaps asleep, with its head, and even its eyes, above the water, floating with the tide. He has known the Sun-Fish make powerful but awkward efforts to escape when attacked, bending and directing its motions in various ways. The back



SUN-FISH.

is dusky grey, the belly and sides silvery: the flesh is bad, but yields a great deal of oil.

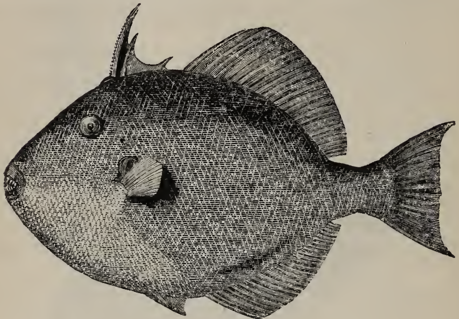
The *Oblong Sun-Fish* seems to be much more rare than the former. It is said to resemble it closely,



OBLONG SUN-FISH.

excepting in its much more elongated shape, the entire length being nearly three times the depth of the body. It grows to a great size, and the flesh is very rank. It feeds on shell-fish. This species is said by M. Cuvier to be found at the Cape of Good Hope.

A single individual of the European *File-Fish* is recorded to have been captured on the Sussex coast, in 1827. It belongs to a very numerous and important family in the tropical seas, the *Balistidæ.* The fishes belonging to this group are called File-Fish, in consequence of the first dorsal fin being studded up the front with numerous small projections, which give it a rough, denticulated appearance when seen under the microscope. The term



FILE-FISH.

Balistes refers to another peculiarity in the structure of this and the second spine. Mr. Lardner says, "Salviani was the first to discover that the bones or rays of the first dorsal fin are so contrived as to act in concert, with considerable force, in suddenly elevating the fin at the pleasure of the animal. Though the foremost or largest be pressed ever so hard, it will not stir ; but if the last or smallest ray of all be pressed but very slightly, the other two immediately fall down with it, as a cross-bow is let off by pulling down the trigger. For this reason, the fish is called at Rome, '*pesce balestra,*' the latter name having been used by the Romans for an engine of war, constructed on a somewhat similar principle, for throwing darts and arrows." The flesh of this fish is held in no esteem, and has even been considered positively deleterious. The solitary specimen, brought by some rare chance to our *ultima Thule*, has been deposited in the national collection of the British Museum. It is a small one, not measuring more than nine and a half inches, whereas the ordinary length is between one and two feet.

CHAPTER XIV.

THE CARTILAGINOUS FISHES.

From the first great series of Osseous Fishes we pass now to the second primary series, called by M. Cuvier, *Chondropterygii*, or *Cartilaginous Fishes*, the skeleton of which, in contradistinction to the former, never consists of true bone, but is made up of cartilage—that is to say, no osseous fibres are formed, but the earthy matter is smaller in quantity, and deposited in grains.

There are several interesting particulars belonging to the fishes of this Order. Compared with the former it is of very limited extent, not above forty species occurring in this country, and of these by far the largest proportion belong to the great families of the Rays and Sharks. Many of them bring forth their young alive, in a very different way from any of the true bony fishes. Some (and those the last in the series) are destitute of the proper jaw bones, and have only the rudiments of them. There are found included within the limits of this Order, fishes showing, in some points of their structure, the highest as well as the lowest degrees of organization noticeable in the whole class. The gills in these fishes are either free (as is ordinarily the case) or they are fixed, by having their outer edges attached to the skin. This peculiarity affords a means of making two divisions, both of which have their representatives among our British fish.

To the first of these *Cartilaginous Fishes with Free Gills* belongs the family of the *Sturgeons* (*Sturionidæ*). These well-known and highly-valued fish are allied to the sharks in the elongated form of the body, which is angular, and defended by large indurated plates and spines, arranged in longitudinal rows. The snout is long and conical, the mouth tubular and without teeth, placed on the under side of the head, at some distance behind the extremity of the snout.

There are but two recognised British species; but in other seas they are numerous, and are of great value to the inhabitants of the northern parts of Europe, extensive fisheries being established for their capture. Almost every part of the body is turned to account,—the flesh as food, the roe made into *caviare*,* the bladder into isinglass (from which we have the jelly called blanc-mange, the court-plaister of our shops, and other useful preparations).

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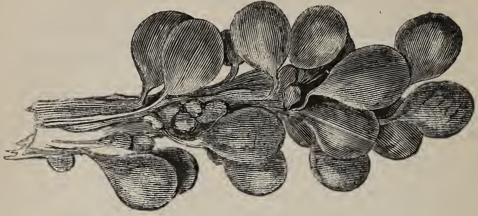
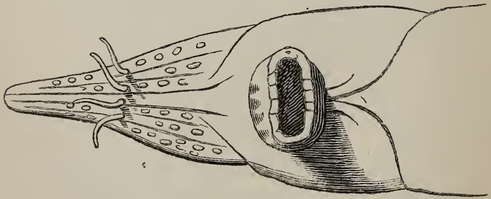
* A figure of the roe of the Sturgeon is given in the next page, drawn from nature. It is of the size and appearance of a bunch of red grapes.



ROE OF STURGEON.

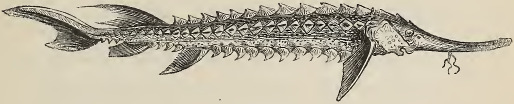
Sturgeons seek their food chiefly among the mud at the bottom of rivers, and their head is admirably adapted for the purpose. The elongated snout, protected by broad plates, ploughs up the mud as a hog does the ground; and it is probably from this habit they got the name of Sturgeons, from the German *stören* (which means to rake up, poke, or stir). A little way behind the point of the snout, and on the underside, is placed a series of worm-like cirri, or feelers, the office of which, no doubt, is to examine the objects turned up by the snout; a little



MOUTH OF STURGEON.

behind these comes the sucker-like mouth, ready to receive what is thus provided for it. (See picture of the under surface of the head.)

The *Common Sturgeon* is of middle size, varying from six to upwards of eight feet. It resembles other fishes in having the gills free, and in being oviparous. It is occasionally taken on various parts of the coast, and frequently at the entrance, or but a short distance up rivers,—very seldom in the open sea, where it is believed to inhabit deep water, beyond the reach of nets. It is never taken with the line, but is usually found entangled in the salmon nets of the fishermen, which it frequently tears to pieces; otherwise it is harmless. It is migratory, passing the winter in the ocean, and entering estuaries and mouths of rivers in the spring. Both in France and in this country the Sturgeon is regarded as a royal fish—the term intending to imply that it is



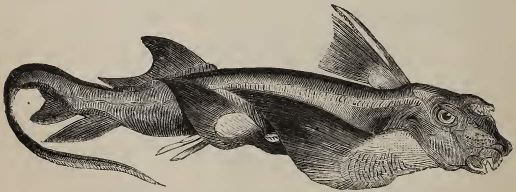
STURGEON.

> "A dainty dish to set before the king;"

and that, accordingly, it ought to be reserved for his use; and there is a provision in the statute-book to that effect still existing. The flesh is firm and compact, tasting somewhat like veal. It is said to feed on small fishes; they must be very "small fry," judging from the structure of the mouth. Elvers and shrimps have been found in the stomachs of some. The largest specimen taken in this country weighed four hundred and sixty pounds. The colours of the body are various shades of brown, the plates nearly white, and the belly silvery.

The *Broad-nosed Sturgeon* is a recently discovered species, differing from the former in having the nose broad and blunt, and the feelers placed nearer to the tip of the snout than to the mouth.

Amongst the rare fishes, of which but a few stragglers have been obtained in our seas, is one belonging to a small family, nearly allied to the sharks, the species of which, from the fantastic shape of the head, are usually called sea-monsters. This is

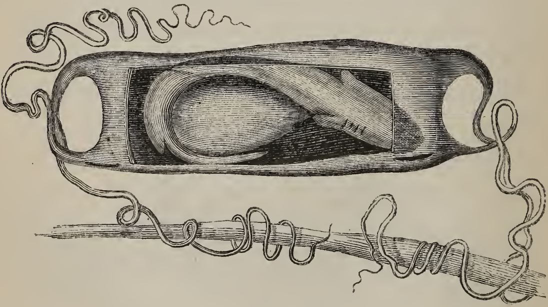


NORTHERN CHIMŒRA.

The *Northern Chimœra*, or Rabbit-Fish, represented as being a fish of singular appearance and beauty, a native of the northern seas only, where it seldom exceeds three feet in length, and is generally taken in pursuit of shoals of herrings and other small roving fishes, on which it chiefly subsists. The flesh is said to be hard and coarse, but, according to some authors, the Norwegians extract an oil from the liver, which is of great use in diseases of the eye. It is called by them the Gold-and-Silver-Fish, because of its resplendent hues. The eyes are large, green, and extremely brilliant, and for this cause it is called, in some parts, the Cat-Fish.

The Family next in order is one whose very name we are accustomed to regard with terror and aversion—that of the *Sharks*, or Squalidæ. In the whole class of fishes there are none more remarkable than these. They are the most perfectly organized of all the cartilaginous fishes, often of gigantic size, and from their strength and voracity are the dread of those who frequent tropical seas. Happily for us, the larger kinds are rarely seen on our coasts, but occasionally individuals are taken. The true Sharks have their gills fixed, and branchial orifices on the sides of the neck, by which the water escapes; the body is lengthened, and gradually merges into a thick tail. The mouth is armed with teeth of a very peculiar construction. They are triangular in form, thin and flat, the central part, however, being thicker than the edges, which are sharp as a lancet, and cut into fine serratures, like a saw. In very large

Sharks the teeth have been found nearly two inches in breadth. They are placed in rows, sometimes to the number of six, one within another, and as the power of the jaws is enormous, they form a most formidable apparatus. Some of the family are viviparous, *i. e.* produce their young alive; in other species they are enclosed in horny cases; the females are larger than the males (as is the case among the predaceous birds), and almost all the race have some significant name, such as Beagle, Hound, or Dog, probably indicative of their habit of hunting their prey, and following it up in company or packs. All the tribe are exceedingly tenacious of life. Their skins, of various degrees of roughness, according to the species, are used for many different purposes, such as polishing wood, coverings for boxes, cases, &c., under the name of shagreen. A figure is here given



SHARK'S EGG.

of one of those semi-transparent oblong cases, so often found on the sea-shore, and known by the name of sea-purses, and sailors' or mermaids' purses, the eggs of the dog-fish, which are deposited by the parent fish near the shore, during the winter months, the long tendrils at each of the four corners being attached to the sea-weed or some other object, so as to prevent the cases being washed away into the deep water. Two openings, one at each end, admit the salt water, and, eventually, the young fish, when matured, escapes through that one near which the head is placed. In the figure a part of the case is removed, so as to show the embryo fish within.

We have three British species of the *Dog-Fish*, the *Small-spotted*, the *Larger-spotted*, and the *Black-mouthed Dog-Fish.*

SMALL SPOTTED DOG-FISH.

The first of these is one of the most common species on our shores, especially on the southern coast. The ordinary length is between two and three feet; it is very voracious, preying on almost any animal substance, and produces about nineteen young at a time. It is often caught on the fishermen's lines—a sad pest to them, and perfectly useless.

The *Large-spotted*, or *Rock Dog-Fish*, is smaller and much scarcer; the spots are larger and scattered, and the ventral fins square at the extremity. Like the former, its haunts are near the bottom, and its food crustacea and small fish. It mostly frequents rocky ground, whence its French name, *Rochier*.

The third species, the *Black-mouthed Dog-Fish*, is rare, and is named from the circumstance of the mouth being dark-coloured within.

Of the proper Sharks, two species have been noticed occasionally in the British seas. The *White Shark*, one of the most formidable of the tribe, is a large and powerful fish, most numerous in the tropical seas, but also abundant in the Mediterranean. As it is a great wanderer, it is not surprising that a straggler is now and then seen off the British shores; but the instances of its capture are few, and somewhat dubious. It reaches the length of twenty-five feet, and is of an ash colour above, and whitish beneath. It swims with great ease and swiftness, from the size of its pectoral fins, and the strength and expansiveness of its tail. The nostrils are large, and it appears to scent its prey at a great distance.

Terrible are all the associations connected with this horrid animal; the French name for which is ominously significant—*Requiem,* indicative of the rest or stillness of death, of which it is the fearful instrument. "When we consider," says M. Cuvier, "its enormous size and power, the strength and number of its teeth, the rapidity of its movements, its frequent appearance during all the turmoil and horrors of a tempest, with death and destruction borne on every blast and every wave, to add to the terrors of the scene by the phosphoric light emitted from its huge body near the surface of the troubled waters, with its open mouth and throat ready to swallow entire the despairing sailor, we must admit the propriety of a name expressive of the natural association of ideas which connects this dread monster of the deep with death."

BLUE SHARK

The *Blue Shark* is an inhabitant of the Mediterranean, and is the species frequently seen following vessels. It migrates annually to our shores, during the pilchard and herring season, and is met with most frequently on the Devonshire and Cornish coasts. It attains to the length of six or seven feet; and the whole of the upper parts are a slate-blue, the under side nearly white.

Mr. Couch, who has had frequent opportunities of observing this species, says: "The Blue Shark is migratory, and I have never known it arrive on the coast of Cornwall before the middle of June; but afterwards it becomes abundant, so that I have known eleven taken in one boat, and nine in another, in one day. The injury they inflict on the fishermen is great, as they hover about the boats, watch the lines (which they sometimes cut asunder, without any obvious motive), and pursue the fish that are drawn up. This, indeed, often leads to their own destruction; but when their teeth do not deliver them from their difficulty, they have another singular mode of proceeding, which is rolling the body round, so as to twine the line about them throughout its whole length; and sometimes this is done in such a complicated manner, that I have known a fisherman give up any attempt to unroll it as a hopeless task. To the pilchard drift-net this Shark is a still more dangerous enemy; and it is common for it to pass in succession along the whole length of the net, cutting out, as with shears, the fish and the net that holds them, and swallowing both together."

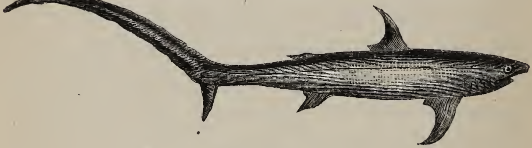
As has been already said, in the Introductory

Chapter, the affection of the Blue Shark for its young was the theme of the older writers, ichthyologists, and poets; and the mariners of the present day still believe that the young brood are received by the parent into his mouth, and find shelter there. The interest taken by the pilot-fish in this Shark has also been alluded to, and a most remarkable anecdote on the subject is thus related in Griffiths's "Animal Kingdom":—

"Captain Richards, during his last station in the Mediterranean, saw, on a fine day, a Blue Shark, which followed the ship, attracted, perhaps, by a corpse which had been committed to the waves. After some time, a Shark-hook, baited with pork, was thrown out. The Shark, attended by four pilot-fish, repeatedly approached the bait; and every time he did so, one of the pilots, preceding him, was distinctly seen from the taffrail of the ship to run his snout against the side of the Shark's head, to turn it away. After some further play, the fish swam off in the wake of the vessel, his dorsal fin being long distinctly visible above the water. When he had gone, however, a considerable distance, he suddenly turned round, darted after the vessel, and, before the Pilot could overtake him and interpose, snapped at the bait, and was taken. In hoisting him up, one of the pilots was observed to cling to his side, until he was half above water; all the pilot-fishes then swam about for a time, as if in search of their friend, with every apparent mark of anxiety and distress, and afterwards darted suddenly down into the depths of the sea."

Colonel Smith, who related this story, himself witnessed, with intense curiosity, a precisely similar scene.

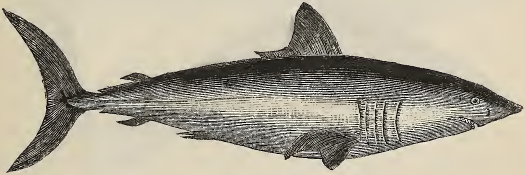
The *Sea Fox*, or *Thresher*, is a fish of considerable size, measuring thirteen feet, including the tail (which alone is sometimes more than six feet long). It is occasionally met with on the British coast, and is called Sea Fox, from the form of the tail, which is very remarkable, the lower lobe being very small, and the upper exceedingly long, curving upwards, and resembling the blade of a scythe. With this formidable appendage it defends itself, and attacks other fishes and whales, striking its blows so violently, that voyagers often hear the sound at a considerable distance. It is not uncommon for a Thresher (as he is appropriately called) to approach a herd of dolphins, sporting securely, and by one splash of his



FOX SHARK.

tail on the water, scatter them all like so many hares before the hound. This fish is an inhabitant of the Mediterranean and other seas.

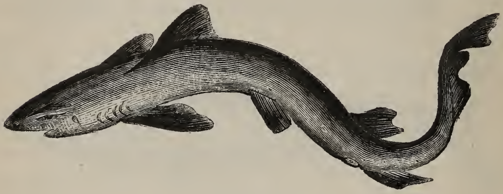
The *Porbeagle Shark* has been taken in different parts of our islands. It is said to derive its name from the fact that it associates in small companies in pursuit of prey, and also from some resemblance it bears to the porpoise. The remains of cartilaginous fishes and cuttles have been found in its stomach. It is said to attain the length of from five to nine feet. Authors do not agree in all the characters they ascribe to this species, and it has been confounded with



PORBEAGLE SHARK.

The *Beaumaris Shark*, which some believe to be the same. There seems little difference, except in the bluntness of the snout.

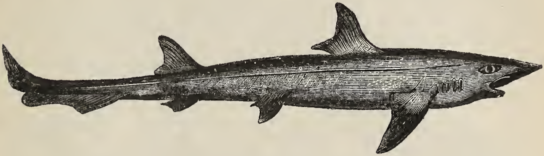
The *Common Tope*, known by the names of Penny Dog, or Miller's Dog, is not unfrequent along the southern coast of England and Ireland, but is less plentiful in the north. It is not unlike the dog-fish, but the number and position of the fins are the same as those of the blue and white sharks. It is a rapacious species, but not so destructive as they are. The largest specimens are about six feet long, and abound, in summer, on the Cornish coasts. The young are to the number of thirty or more, and remain off shore the first winter, not reaching the full size till the second year, when they retire into the deep water. No use is made of this fish, excepting melting the liver for oil. In its efforts at escape it sometimes has recourse to the same method of twisting the line round its body before mentioned. Its principal resort is the Mediterranean sea, where it is common.



COMMON TOPE.

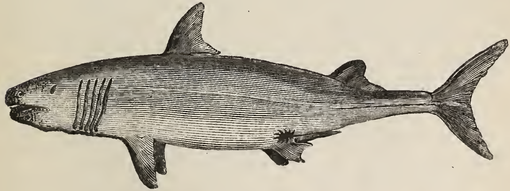
The *Smooth Hound*, or *Skate-toothed Shark* is rather a common species on most parts of the coast. I'ts teeth are flat and blunt, forming a closely-compacted pavement on each jaw, and greatly resembling those of the skate. Its skin is much smoother and softer than that of the sharks in general; it is from three to four feet in length; and is said to be eaten in the

Hebrides, and esteemed a delicate dish. With reference to its habits, we are told that it keeps close to the bottom on clear ground, where it feeds on crustaceous animals, which it readily crushes with its tesselated teeth. It also takes a bait, but is less rapacious than most of the tribe. The young are produced alive; they are few, not exceeding perhaps a dozen, and soon after birth betake themselves to the deep water.



SMOOTH HOUND.

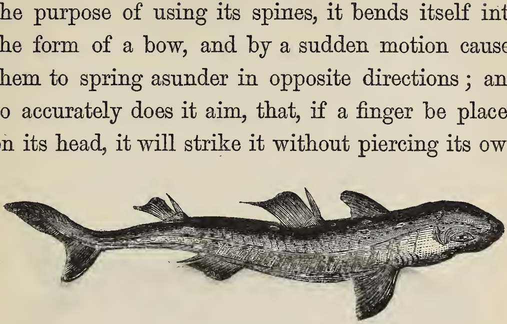
The *Basking Shark*—so named from its habit of remaining occasionally at the surface of the water, almost motionless, as if enjoying the influence of the sun's rays—is by far the largest of our native fishes,



BASKING SHARK.

frequently measuring upwards of thirty feet. Happily, this monster fish is harmless and inoffensive, much less voracious than its congeners, and its food seems confined to marine plants, medusæ, the roe of fish, &c. Mr. Low adds that this Shark's appearance and manners, and general construction, do not indicate it to be a ravenous fish; in fact, its teeth are the smallest in size of any of the tribe. The liver is of large size; and from this fact it is a most valuable prize, the fishermen sometimes realizing a profit of 20*l.* for a single fish. Of course it is eagerly attacked; and so indifferent is it to the approach of a boat, that it will even suffer its body to be touched, whilst lying listlessly, sunning itself on the surface of the waves. If struck with a harpoon, it appears unconscious of injury, till the weapon be deeply infixed, and then it plunges headlong to the deep, and swims away with such rapidity and violence as to make it a difficult and dangerous capture. It has been taken nearly all round our coasts, and occasionally enters the Firth of Forth.

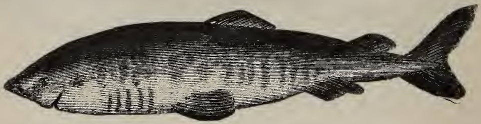
The *Picked Dog-fish* is the most common of all the Sharks, and found everywhere in the British and Irish seas. It is at once distinguished from all others by a single spine, placed in advance of each of the two dorsal fins; whence its name "*pick,*" being synonymous with pike or spike. It measures from three to four feet, and is of a blue slate on the upper parts, the under being yellowish white. For the purpose of using its spines, it bends itself into the form of a bow, and by a sudden motion causes them to spring asunder in opposite directions; and so accurately does it aim, that, if a finger be placed on its head, it will strike it without piercing its own skin. The fishermen dread the wounds it inflicts, which are severe, and bad to heal. It is no small annoyance to them, cutting their hooks from the lines in quick succession. Being gregarious, these fishes often make their appearance in such shoals that boats are loaded with them to the water's edge; and among the Western Isles and Orkneys, they are salted and dried for food; the livers yield a quantity of oil, and the offal makes manure. The Scotch call this fish Hoe; while on the southern coast it goes by the name of Bone Dog. It is ovo-viviparous, and produces many young at a time.



PICKED DOG-FISH.

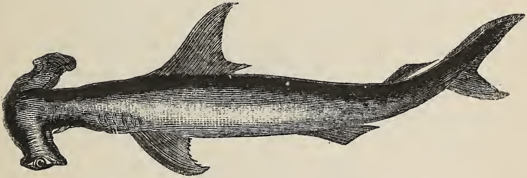
The *Greenland Shark*, a native of the Northern seas, has been thrice observed on our coasts. An interesting account is given of it in Dr. Scoresby's

"Arctic Regions." It is twelve or fourteen feet in length, sometimes more; and its colour is ash-grey. This Shark is a great foe to the whale, which it bites and annoys while living, and devours when dead. Insensible to pain and tenacious of life as are all the larger sharks, this species is pre-eminently so. An external wound seems to have no effect on it; and even when run through the body with a knife, it will return to the same place, and continue to gorge itself. When cut to pieces, the separate parts of the body retain their vitality for a long time; and it is dangerous to put the hand into the mouth after the head is severed from the trunk. The heart, which is very small, beats only six or eight times in a minute, and actually continues to pulsate for hours after being taken out of the body! The Greenlanders eat its flesh, both fresh and dried, and make ropes of its rough skin. Its eyes are often infested by a parasitical insect.



GREENLAND SHARK.

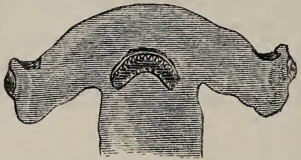
The genus of Sharks next in order, according to M. Cuvier's arrangement, is that of the *Hammer-headed Sharks;* of which a single specimen was captured, in 1829, off the Yarmouth coast, the head of which is preserved in the Norwich Museum. The singular form of the head, from which this genus obtains its name, at once distinguishes it most unmistakeably from all other fishes. There is nothing more extraordinary in the whole class. The head is truncated, and the sides extended horizontally into a kind of branch, the eyes being placed at each extremity: they thus look as if they were planted on two thick peduncles. M. Cuvier was of opinion that no similar formation existed in the animal kingdom; but Mr. Swainson has remarked, with truth, that a precisely analogous arrangement is seen in the small American insects named Diopsis. In the following sketch, the reader has an opportunity of judging for himself. The head of the Shark I have drawn from the specimen above mentioned, giving the representation of the under side, in order to show the position of the mouth. The eyes are furnished



HAMMER-HEADED SHARK.

with eyelids; the iris is golden yellow; the nostrils are placed close behind the notch over each eye.

HEAD OF HAMMER SHARK.

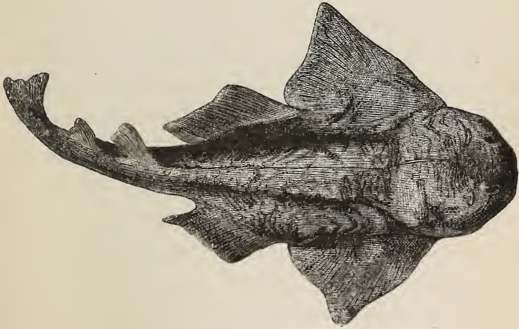


DIOPSIS BREVICORNIS.

The habits of this species are very much like those of the other great Sharks: it is said to be very ferocious, not hesitating to attack man occasionally. It frequents deep waters, and measures seven or eight feet in length. The flesh is very hard and leathery.

A few specimens have been taken off our shores of the *Spinous Shark*, a very remarkable species, exceedingly well known to naturalists, and having a wide geographical range, extending from the Northern seas to the Cape of Good Hope. It varies in length from four to seven or eight feet, and also proportionably in its bulk. The most remarkable peculiarities are, the position of the first dorsal fin, which is opposite to the abdominal one, and the numerous spines scattered over the surface of the skin ; these spines greatly resemble the prickles on the stems of a rose-bush : they are said to be most numerous in the males. This Shark is described as sluggish and unwieldy in its movements, and seldom to be seen above the surface. It seems to be one of the ground Sharks, as it is usually caught when the bait is near the bottom.

Partaking of the characters both of the sharks and the rays, though in some respects distinct from either, the *Angel Fish* belongs to a genus exactly intermediate between these two families. It is a singular-looking fish, and certainly has by no means an agreeable aspect. Its name is said to be given it on account of the extended pectoral fins having



ANGEL FISH.

the appearance of wings; but, when looking at it, I confess the appellation of Monk-fish, which it is sometimes called, has seemed to me much more characteristic: the rounded head and broad-spread fins have some resemblance to a monk's hooded cowl. It is by no means rare on our coasts, especially in the northern parts of the kingdom. It sometimes attains a large size, ordinarily from five to seven or eight feet, and is voracious, preying on other fish, and keeping near the bottom, hiding itself occasionally in the loose, soft soil. The flesh is now considered so indifferent, it is seldom eaten; but formerly it was in good repute. The skin is rather rough, insomuch that the fish was described by Aristotle by the name of *a file*, in reference to this circumstance. The colour is a dark mottled chocolate-brown above, the under side dirty white.

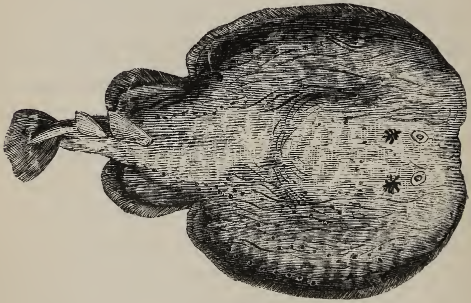
CHAPTER XV.

THE FAMILY OF RAYS, OR SKATES.

> "The hook'd *Torpedo* ne'er forgets its art,
> But, soon as struck, begins to play its part,
> And to the line applies its magic sides;
> Without delay the subtle power glides
> Along the pliant rod and slender hairs,
> Then to the fisher's hand as swift repairs.
> Amazed he stands, his arm of sense bereft;
> Down drops the idle rod—his prey is left."

THE *Family of Rays*, or *Skates*, may well be called the flat-fish of the Cartilaginous Order, as they are even more strictly so than the flounders, their peculiar form wonderfully adapting them for existing at the bottom of the water. The name Ray is supposed to be derived from the Saxon word "reoh," which means "rough," many of the species having a rough, granulated skin. Their great proportional breadth is caused by the uncommon size of the pectoral fins, which form a wide angle at the sides, and completely envelope the head, often even extending in front of it in a long conical projection. They grow to a very large size, sometimes exceeding two hundred pounds in weight. The females are the larger, and produce their young alive, only one at a time, which, like those of the shark, are enclosed in square-shaped horny shells, ending not in tendrils, like theirs, but in slender curved points. Till quite recently the Rays were believed to be exclusively salt-water fish; but the researches of naturalists have now proved that many kinds are strictly river fish. The liver is large, and yields a great quantity of oil.

We have some four or five British genera, including, in all, about fifteen species. Of these the famed Torpedo is one. The *Common Torpedo*, or *Electric Ray*, has been long known as existing in the English seas, having been taken at Torbay and elsewhere, although but rarely met with. The almost perfectly circular disc formed by the body, and the short thick tail, at once distinguish the fishes of this group, which are



ELECTRIC RAY.

also so much celebrated for the possession of powerful electrical properties. The species of Torpedo are pretty numerous, and naturalists are not decided as to the proper name of our British one. It frequents deep water, and seems in its habits—which, however, are but imperfectly known—to resemble the other large Rays. It is sluggish and inactive, and likes sandy places, in which it sometimes buries itself, flinging the sand over it by quickly flapping its extremities. It is in this situation, according to Pennant, "that the fish gives his most forcible shock, which throws down the astonished passenger who inadvertently treads upon him." Its food consists principally of fish, a surmullet and plaice have been found in the stomach, and these it is believed to secure by means of its galvanic apparatus. This structure occupies a large space on each side of the body, and consists of a great number of tubes which reach from the upper to the under surface, and have very much the appearance of a honeycomb. The whole use of this electric power to the fish is only conjectural. It seems very probable that it may serve as a means of defence, and Mr. Couch is of opinion that it aids in the process of digestion by rendering the animals so killed more susceptible of speedy decomposition.*

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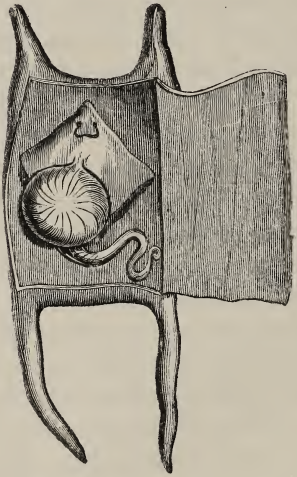
* It is a well known fact that the bodies of animals killed by lightning do not become stiff.

On touching this fish there is frequently (though not always) felt a peculiar painful numbness, which somewhat resembles the feeling produced by striking the elbow violently against any hard substance. This singular quality in the Torpedo has been taken notice of in all ages, and very exaggerated accounts have been given of it. Thus Oppian, in the lines quoted at the commencement of this chapter, does not hesitate to say that it will benumb the fisherman, even through the whole length of line and rod. It is generally taken (like other flat-fish) with the trawl, but it has been known to take a bait, thus vindicating, in one particular, the correctness of the poet's statement. "So long ago as the time of Dioscorides, the physician of Antony and Cleopatra, the shock of this fish was recommended for medical purposes, and especially for pains of the head; and this may be considered as the earliest record of the application of electricity to medicine. In later times it was applied to the cure of the gout; the patient being directed to keep his foot on the fish till the numbness extended to the knees." Baron Humboldt remarks, "that the will of the fish directs the effect to whatever part it feels most strongly irritated, but only under the influence of the brain and heart. When a fish was cut through the middle, the fore part of the body alone gave shocks." The Torpedo —at least the British species—attains to a large size;

according to Pennant, it has been known to weigh above eighty pounds.

The genus *Raia*, or *Skate* (as popularly it is called), is of great extent, and includes many well-known fishes,—some of them valuable as food. The form of the body, as before said, is very remarkable; exceedingly flat and broad, and of a rhomboidal shape. In fact, the Skate may almost be said to have no true head or neck, the sides of both being surrounded, and thus protected, by the wide-spreading margin of the pectoral fins. Their mode of progression is very peculiar, being performed with a slight motion of the pectoral fins, something between a slide and a swim. This refers to their usual movements; but when in pursuit of prey, or escaping from danger, great muscular exertion is evident. The mode of defending itself, as described by Mr. Couch, is very effectual; the point of the nose and the base of the tail are bent upwards towards each other; the upper surface of the body being then concave, the long narrow tail—frequently furnished with two, and sometimes three small fins, and mostly armed with one or more rows of sharp spines along its whole length—is lashed about in all directions; and frequently inflicts severe wounds.

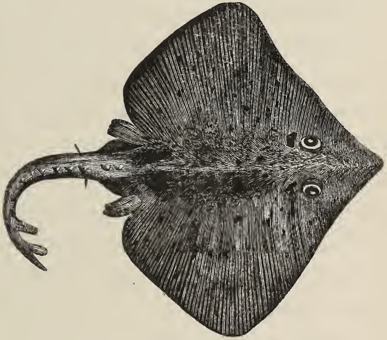
It may be here stated, generally, that the Skates are very voracious: their food consists of any fish they can catch, with mollusks and crustacea. So powerful are their muscles and jaws that they are able to crush the strong shell of a crab with ease. The young are produced toward the end of spring, or during summer; the horny cases in which they are enclosed are called "purses," and on the coast of Cumberland "skate barrows," from their resemblance in shape to a four-handed machine used to carry goods.



EGG OF SKATE.

There are nine or ten species of true Rays found on our coasts, and they have been arranged in two divisions: those having the snout more or less sharp, and those with blunt noses; the latter are furnished with numerous sharp spines on various parts of the body, and lead, by a natural transition, to the species which are still more powerfully armed.

The *Long-nosed Skate*, or *Shagreen Ray*, is distinguished by the great length of the nose, which is narrow and sharp. The upper part of the body is of a cinereous brown, covered closely with minute shagreen-like tubercles, resembling the skin of the dog-fish. The under side is white, and the teeth are slender and sharp as needles. It grows to a considerable size, and is said to feed on sand-eels and the sand-launce. It frequents deep water, and is not caught in the winter. Mr. Yarrell says, "Skate, as food, are held in very different estimation in different places. In London, particularly, large quantities are



LONG-NOSED SKATE.

consumed, and the flavour is considered delicate; but on some parts of the coast, though caught in considerable numbers, the flesh is scarcely used for any other purpose than to bait pots for crabs and lobsters." They are in best condition during the cold months.

The *Blue Skate, Grey Skate*, or as it is frequently called, *the Skate*,—to distinguish it from the Thornback and Homelyn, which are also popularly called Skate,—may be regarded as the best known species of the genus, and is not uncommon on most parts of the coast, being used in large quantities for the table, and decidedly superior to the others. Its ordinary size is from two to four feet, but examples have occurred in our seas weighing two hundred pounds. The nose is sharp, lengthened, and conical, the colour of the surface greyish brown, and beneath, greyish white with black specks; the whole surface is more or less granulated. The females are larger and more numerous than the males, and the latter have several rows of sharp hooked spines toward the sides of the pectoral fins. They are very voracious, feeding on other fish and crustacea, and they do not themselves seem to be much preyed upon by the other inhabitants of the ocean. Dr. Parnell says these fishes are met with, in great numbers, in the Firth of Forth. In the spring months the Edinburgh market has a daily supply, and the demand is very great.

The pectoral fins are the part generally used as food, and when cut in a particular way, are sold under the name of "crimped Skate."

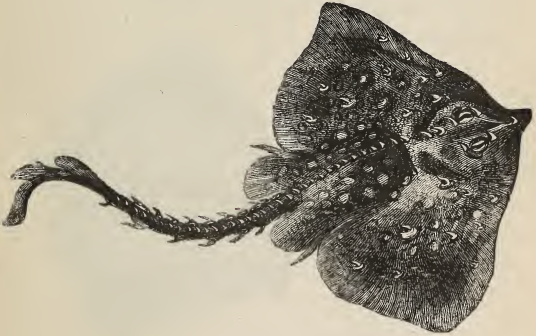
The *Sharp-nosed Ray* has the snout sharp, slender, and very much elongated. It may be easily recognized by this, and by the waved line of the margin of the body, from the nose to the centre, and by its pure white colour underneath. It is the largest of the British Rays, and is also thicker in proportion than the others: the tail is armed with three rows of spines. "The French are great consumers of Skate, and this species is their favourite fish: their boats come to Plymouth during Lent to purchase Skate, which they preserve fresh and moist during the run back to their own coast by keeping them covered with wet sand." This Skate is known by various names in different places, such as White Skate, Burton, and May Skate. It has been taken on many parts of the coast, and in some places is by no means rare. Mr. Pennant caught one of these fishes, which was nearly seven feet long; when just brought on shore it made a remarkable snorting noise. He says, "This has been supposed to be the *Bos* of the ancients, which was certainly some enormous species of Ray." Oppian calls it "broadest among fishes."

The *Bordered Ray* is so called on account of having a broad dusky border on the under side, the other parts of the surface being white. The skin is smooth, and the snout sharp, slender, and moderately long: a few specimens only have been taken in England. Although frequent in the Mediterranean, its habits are little known.

The *Flapper Skate* is another sharp-nosed species (first described by Dr. Parnell as obtained in the Firth of Forth), which seems to be a connecting link between the Sharp-nosed and the Blue Skate.

Of the Blunt-nosed Rays, the *Homelyn* and the *Thornback* are the two species most common in the London market. They are not very dissimilar in shape, though otherwise perfectly distinct. The former is called the Sand Ray and Spotted Ray; it is subject to great variety in colour and marking: sometimes the upper surface is numerously spotted, at other times sparingly so, or not at all; and occasionally it has only one eye-like spot on each side. These varieties have given rise to different names. The nose is short and rather obtuse; the teeth, in the adult fish, are sharp-pointed, the skin smooth, and generally there are three rows of spines on the back. It is from two to three feet long. The colour is brown or reddish brown, marked with distinct roundish dusky spots. This fish is most frequent along the southern coast.

The *Thornback* is one of the best known fishes of the tribe generally dispersed throughout the British seas, and almost everywhere caught in large numbers. There is no difficulty in distinguishing it, as it is known at once by being studded at intervals all over the surface with rounded nail-like tubercles, which terminate in strong curved spines. The tail is armed with several rows of spines, and a single row runs up the dorsal ridge. The prevailing colour is brown, with numerous lighter spots; the colour beneath is pure white, with a few spines only. The flesh is reckoned good. It feeds on other fish,—flounders, herrings, sand-eels, and also crustacea; and, being taken in immense quantities, is one of the most valuable of the species. The young are called "maids." As a general rule, the teeth of the adult male fish are angular, while those of the female are

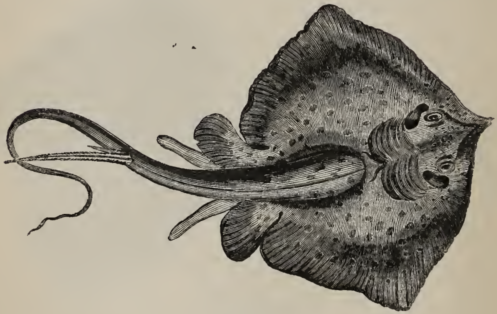


THORNBACK.

blunt. When young they are broad and flat in both alike.

The *Small-eyed* or *Painted Ray*, and the *Starry Ray*, are both very rare and little known.

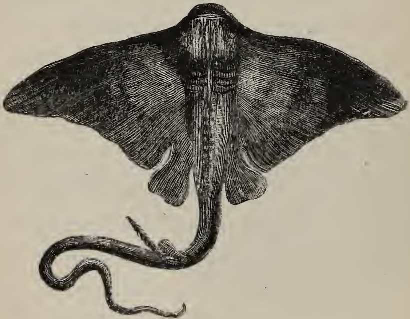
We have still to notice three other British Rays, belonging to three separate genera, distinguished by the more formidable nature of their offensive apparatus. In these fishes the tail is long, tapering gradually to a point, and without fins, and it is armed towards the upper part with a very strong spine, sharply serrated on both sides. In other respects they differ materially from each other.



STING RAY.

The *Sting Ray* or *Common Trygon*, is the only one of this sub-family found in this country in any numbers, and it was known as an inhabitant of our seas to the earliest British naturalist. It is most frequent on the southern coasts, from Sussex as far west as the county of Cork in Ireland. In almost all the European seas, and in every part of the Atlantic, it is plentiful, and is a common fish in the Mediterranean. The Sting Ray was well known to the ancients, who attributed to it the most fearful powers, believing its sting to be so venomous that it could destroy the vital powers of vegetation. Mr. Couch, with his accustomed zeal and discrimination, has watched its habits, and says that it keeps on sandy ground, at no great distance from land, and in summer wanders into shallow water, where it is sometimes entangled in the nets,—the only way in which it is commonly taken, as it rarely swallows a bait. The manner in which it defends itself is by twisting its long, slender, and flexible tail round the object of attack, and tearing the surface with the serrated spine, lacerating it in a manner calculated to produce violent inflammation. Other authors state that it is capable of striking its weapon with the swiftness of an arrow into its prey or its enemy; when, with its winding tail, it secures its capture. These spines, it has been proved, possess in reality no venomous quality; but lacerated wounds are always painful, and in certain habits of body frequently very severe. In some countries, serrated fish-spines are used to point arrows and spears, and prove most formidable weapons. The usual size of this species is from two to three feet,—rarely more. The spine is said to be annually renewed; the new one sometimes appearing before the old one is cast. The body is quite smooth, the flesh very rank, and the liver large, yielding a great deal of oil.

The *Eagle*, or *Whip Ray*, is so called from the wing-like form of the pectoral fins, and from the long, slender, and flexible character of the tail. It is also called the Miller, on account of the form of its teeth. Each jaw forms part of a circle, and from a particular rolling motion, added to the crushing power of these teeth, the genus has obtained the name of Myliobatis, *i.e.* Mill Skate. This curious fish has been only recently admitted as British, but one perfect specimen having been obtained. It is extensively distributed, and attains a large size, sometimes measuring fifteen feet in length,



EAGLE RAY.

and weighing three hundred pounds. "It swims pretty rapidly, with a kind of sailing motion, and little action of the pectoral fins, and when taken, vibrates its tail violently; the first care of the fishermen is, therefore, to cut off the caudal spine, which in a large specimen is a very formidable implement."

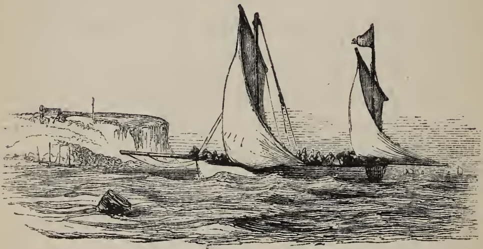
Of the *Horned Ray*, a single specimen was found in 1835 on the southern coast of Ireland. This species belongs to a genus (Cephaloptera), which differs most conspicuously from the other spiny-tailed Rays in the form of the head, which is cut short in front; while the pectoral fins, instead of surrounding it, are each prolonged considerably in front, so as to present the appearance of two horns. The species are also very remarkable for the enormous size they sometimes attain. The Banksian Ray, which belongs to this genus, is said to have been taken of such weight that seven yoke of oxen were required to draw it on shore. Voyagers tell of having seen fishes of this kind upwards of twenty feet long, swimming about their vessels, and the most distressing accounts are given of their destructiveness to human life. In Griffith's Cuvier it is stated that Colonel H. Smith once witnessed the destruction of a soldier by one of these cephaloptera, off Trinidad. It was supposed that the man, being a good swimmer, was attempting to desert from the ship, which lay at anchor in the entrance of the Bocca del Toro. The circumstance occurred soon after daylight, and the poor fellow, being alarmed by the call of a sailor from the main cross-trees, endeavoured to return to the vessel, but the monster threw one of his fins over him and carried him down.

In Ulloa's Voyage to South America, it is mentioned that a species of Ray is the terror of the negroes employed in the pearl fishery at Panama. It is called there Manta, or the Quilt, from its enveloping or wrapping up the unhappy divers till they are suffocated. The negroes, therefore, do not venture to go down without a sharp knife to defend themselves from the assaults of this terrible enemy.

As a conclusion to this chapter, the reader is referred to a paper in the *Illustrated London News*, March 27th, 1858, in which an account is given of "The Devil Fish in South Carolina." This Devil Fish belongs to that genus of the Ray family we are now considering. It is thus described :—"An average specimen might be characterized thus,—body ten feet long, tail six feet, entire width seventeen feet, and the depth of the body from three to four feet; in colour, blue-black above, cloudy-white beneath, tail slender (somewhat like that of a cow), with a serrated spine, the dorsal fin being directly over the base of the tail. . . . eyes very prominent, and its most striking peculiarity, a pair of horns or feelers, extending forward from near the eyes a distance of three or four feet.

"They leave the deep sea and enter the estuaries of Carolina during the months of July, August, and September. They swim near the surface of the water, and, when in the mood, lift above the surface one or both of their bat-like wings. They are graceful in all their movements, and when not wounded, quite tame; and it is sometimes the case that, when they have been sought for in vain, hundreds of them have instantly risen to the surface, as if actuated by one impulse. They are supposed to feed upon small fish, and a floating substance called blubber. They are not eaten, but yield a good quality of oil, and that they are very powerful is proved by many well-authenticated facts."

There is much excitement, and even danger, attending the chase of this powerful creature; when endeavouring to free himself from the deadly weapon, his plunges are fearful, and the lashing of the water with his wings is something not to be forgotten. Occasionally he starts for the open sea, and will give his pursuers a run of from five to thirty miles, and sometimes even a whole day is requisite to capture a single fish. "He who wields the harpoon should have a steady arm and a cool head; for if he lose his presence of mind, and suffer himself to be entangled in the rope, during the first furious run of the fish, he may lose his life."



CHAPTER XVI.

THE FAMILY OF THE LAMPREYS. (Petromyzidæ.)

> "... Consider the innumerable multitude of beings inferior to us, a chain that descends from ourselves, to the verge of nonentity, by such mutations of littleness that they are for ever eluding our senses."

> "Thy universal works are full of Thee,
> The least, the greatest,—each and all divine."

We are come to the last family of the Cartilaginous Fishes,—those having fixed gills. The fishes of this group are, in reference to their skeleton and in some other respects, the lowest in the scale of organization among vertebrate animals. With the exception of two species they are small, and of no commercial importance; but they are very interesting to the naturalist, as showing the gradual approaches which one class of animals makes to another, and how narrow and almost imperceptible are the divisions between them.

The *Family of the Lampreys* (*Petromyzidæ*) are so called from the habit these fish have of attaching themselves to stones and rocks, by which means they are preserved from being borne away by the current of the water. The word lamprey is probably derived from the Latin *lambendo petras*, and the term *Petromyzon* is composed of two Greek words, signifying stone-sucker: they have been also denominated Cyclostomes, or Round-mouthed Fishes, from the circular form of the mouth. The species resemble eels in the elongated and rounded shape of the body, and the resemblance holds good in respect to some of their habits. In the typical species, the branchial cells, and the gills within them, are situated along the side of the neck, and there are seven apertures leading to them by which the water is admitted and expelled. Like the sharks and rays, the Lampreys are without a swimming bladder, and, being also without pectoral fins, are usually found near the bottom.

LAMPREY.

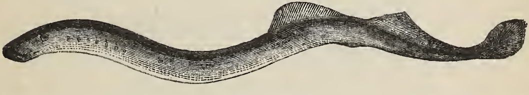
The *Lamprey*, or *Sea Lamprey*, is the best known and largest member of the family. It measures from two to three feet, the body is thick and cylindrical, and the colour yellowish brown, or tinged with green, and marbled with dusky shades.

When the Lamprey is firmly attached to any substance by its mouth, obviously no water can pass by it from the throat to the gills ; it is therefore received and expelled through the external apertures, and the same method of respiration is believed to take place in the Myxine (presently to be noticed), when its head is buried in the flesh of its prey. This species has a very extensive range throughout Europe and North America. It is found in the Mediterranean, and as far north as Scandinavia, during the spring. It is rather common in the summer months in some of the rivers of the southern coast of England, particularly the Severn ; and it is migratory, residing during the winter months in the ocean, and ascending rivers in the spring for the purpose of depositing its spawn. At this time it is considered in perfection as food, and is prepared in various ways for the table, being in flavour not unlike turtle. The potted lampreys and lamperns of Worcester have a high repute. A few are caught in the Thames ; and notwithstanding the various obstacles in that river, they are said to make their way as far as Oxford.

In spawning, the Lamprey selects a spot where the stream is rapid, and the ground of sand or gravel. By the aid of the sucker-like mouth, these fish can remove individually each stone,—"Their power is immense; stones of a very large size are transported, and a large trough or furrow is soon formed. The fish remain in pairs; two on each spawning place, and while thus engaged, retain themselves affixed by the mouth to a large stone." Their food consists generally of any soft animal matter, and occasionally they attack other fishes, fastening upon them, and with their small rasp-like teeth eating away the soft parts down to the bone. The motion in swimming is lateral and undulating, like that of a serpent; but where the current is rapid, the fish makes successive plunges forward, and fastens itself to any fixed substance at hand, so as to retain its position.

In former days, the Lamprey was accounted "a very dainty dish," and one of our monarchs (Henry I.) is said to have died in consequence of a too plentiful meal of this fish. Pennant says it was an old custom for the city of Gloucester annually to present his Majesty with "a Lamprey pie, covered with a large crust."

The *Lampern*, or *River Lamprey*, is a well-known species which abounds in many rivers of England, particularly the Thames, the Severn, and the Dee; it is also plentiful in several of the rivers of Scotland and Ireland. It is not quite certain whether this species is migratory like the former; but, unquestionably, specimens may be found in fresh water all the year round. It seldom exceeds a foot in length. The general form resembles that of the Sea Lamprey, but it is more elongated in proportion. The colour is dusky blue above, and silvery beneath. Formerly this was regarded as a fish of considerable importance, being much used as a bait for other fishes. The Dutch, especially, bought vast quantities to be used for catching cod, and Mr. Yarrell tells us that formerly the Thames alone supplied from a million to twelve hundred thousand annually. They are very tenacious of life, and the Dutch fishermen managed to keep them alive at sea for many weeks. They are said to feed on insects, worms, and small fish. The spawning season is May, and sometimes they are seen in pairs only, while at other times numbers congregate at a common spot. In the "Wild Sports of the Highlands" there is the following most pleasing account of what the writer himself witnessed:—"One summer's day I was amused by watching the singular proceedings of two Lampreys, in a small ditch of clear running water near my house. They were about six inches in length and as round as a pencil. The two little creatures were most busily employed in



RIVER LAMPREY

making little triangular heaps of stones, using for the purpose irregularly shaped bits of gravel, about the size of a large pea. When they wished to move a larger stone, they helped each other in endeavouring to roll it into the desired situation. Occasionally they both left off their labours, and appeared to rest for a short time, and then to return to the work with fresh vigour. The object of their building I am not sufficiently learned in the natural history of the Lamprey to divine, but I conclude their work had something to do with the placing of their spawn. It seems, however, so singular a manœuvre on the part of fish to build up regular little pyramids of gravel; bringing some of the stones from the distance of two feet against the current, and rolling them to the place with evident difficulty, that the Lampreys must have some good reason which induces them to take this trouble."

Very similar in appearance to the River Lampern is the *Fringe-Lipped* or *Planer's Lampern*, but it is much shorter in length, and the two dorsal fins are close together, while in the other species they are widely apart. It may be also easily recognised by its having the whole edge of the circular lip furnished with numerous papillæ, forming a thickly set fringe, from which peculiarity it has received its name. It has been obtained from several of the English rivers, as well as from those of Scotland and

Ireland. In its colours and habits it so closely resembles the common Lampern, that it is doubtless often mistaken for it. Probably, both may go to the salt or brackish water when within reach of the tidal influence. A writer, in the "Zoologist" for 1854, says, that great quantities of the Fringed Lampern have recently been found in the river Frome, near Dorchester; he adds, "I had noticed two, about a fortnight since, and was much amused at their proceedings. They were in a small rivulet; I watched them for nearly an hour, during which time they were constantly employed in removing stones, and this evidently in their search for food. Their mode of proceeding was to attach themselves to the stone, and then by wriggling their bodies, to detach it from its bed, and then, making a spring forward for about eighteen inches, they dropped the stone. They never made a second dart with the same stone. On dropping the stone, they immediately returned to the spot from which they had removed it, and nozzled for some time in the mud and sand, leaving me to infer they were searching for food. We thus see an adaptation of the mouth of this fish to its habits; it doubtless feeds on the minute animals found in abundance under all the stones."

The *Pride*, *Sandpride*, or *Mud Lamprey*, is a small fish, very similar to the young of the Lampreys found in fresh water. It is from six to eight inches in length, and about the thickness of a swan's quill. The form of the body, the branchial apertures and fins, are like those of the Lampreys, but its prominent lip is in the form of a horse-shoe; and, the circle being incomplete, it has not, as those species have, the power of attaching itself to hard substances, but generally hides itself in the muddy or sandy bottoms of rivers and brooks in this country, where it is not rare. It is said to be common about Oxford, and was called by Dr. Plot, in his History of Oxfordshire, "the Pride of the Isis;" *Prid* being used as the diminutive for lamprid, the ancient name of this fish. It is also very common in the Thames, about Hampton. According to some, the eel is one of its greatest enemies, and eagerly devours it. It feeds on worms and insects, and dead or even putrid matter. Mr. Couch says, "I find this species frequents our smaller streams in Cornwall. I have kept it for months in stagnant water with mud at the bottom. The only apparent use of its fins is to enable it to regain its station when forced from it by violent torrents. It rarely, if ever, willingly emerges from the muddy bottom. When kept in clear water it seems to

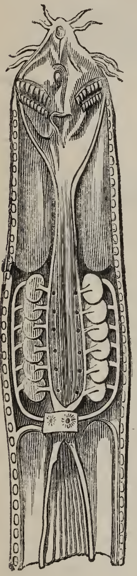
MUD LAMPREY

sleep much. I have never found this species to attach itself to any object by the mouth; but the lips are capable of extensive and complicated movements."

The *Myxine, Glutinous Hag,* or *Borer*, so much resembles a worm that it was actually placed by Linnæus in the class *Vermes;* and it was not till after careful examination by dissection and accurate descriptions, that it was recognised as related to the Lampreys. In this last family of fishes—the lowest and most rudimentary among vertebrate animals—the skeleton is very imperfect, and in the Myxine, in place of a series of bones for the spinal column, there is simply a soft and pliant cartilaginous tube; while in the diminutive fish called the Lancelet, which is the last of the British species, we find only a small and slender support extending through and connecting the whole length of the body, closely resembling the structure in molluscous animals. With regard to the habits of the Myxine, it is said to enter the mouths of other fish, and completely to devour the whole, except the skin and bones. By

MYXINE.

what means an animal which is without eyes is able to find its way seems difficult to tell. Some believe that it is swallowed by the fish in which it is found, while others conjecture that it does not fasten on any fish unless it be either dead or hooked. The eight barbules or cirri about the mouth are doubtless delicate organs of touch, which assist it in discerning the nature of the substances with which it comes in contact, and the single hooked tooth upon the palate enables it to retain its hold until its prey be brought within the reach of the double rows of teeth upon the tongue.



INTERNAL ORGANS OF THE MYXINE.

In the figure here given, we have an admirable representation of the internal structure of this singular animal (taken from an engraving from a drawing by Mr. Clift, in the Philosophical Transactions for the year 1815). It is thus described by Mr. Yarrell :—

The upper part of the figure shows the single spiracle, about it the eight tentacula, on the centre of the palate the single hooked tooth ; to the right and left, the double rows of teeth on the tongue ; below are the six branchial cells, with their internal communications with the central canal. Beneath these are the stomach and intestinal canal; the rounded marks along the margin on both sides from end to end show the numerous mucous glands.

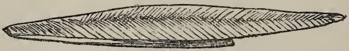
These pores extend, in two rows, along the whole length of the body beneath, and the fish has the power of ejecting from them a large quantity of gelatinous secretion, by which means it is said to escape from its enemies. So thick is this jelly-like mucus that the name of "Glutinous Hag" was given in consequence of it to the animal.

It is deeply interesting to observe the closeness of the links by which the chain of organized beings is connected together. How gradually the peculiarities of structure are shaded off into each other, so that it is impossible to fix accurately the place where one family ends and another begins.

That this singular fish takes a high northern range, is shown by M. Nilson's including it among the fishes of the shores of Scandinavia; where, he adds, four, or even six have been found within the body of a haddock, the flesh of which was entirely consumed. As a British fish it occurs most frequently on the eastern coast; in some parts it is called Hag, and in others Borer, because it is said to pierce a small aperture in the skin, and afterwards to make its way into the body.

In form, it is elongated and eel-like, the length from twelve to fifteen inches. It is without eyes, and has feelers about the lips.

The last among British Fishes is the *Lancelet*, a singular little animal, of which a figure is here given of the natural size.



LANCELET.

One of the smallest of the race, it is by no means one of the least interesting; indeed, it has awakened great curiosity among naturalists, on account of the many anomalies it presents, especially when regarded, as it now seems decided it must be, as a vertebrate animal. It has occurred several times in the British seas, and is not unknown on the Continent, having been found on the coast of Norway and Sweden, and also in the Mediterranean. The rarity of the animal has always made it difficult to procure; but Mr. Goodsir, of Edinburgh, having obtained two specimens, taken on the Manx coast, has given a full and lucid description of this extraordinary creature, the lowest link at present in the scale of vertebrate animals. Pallas and the early naturalists arranged it with the slugs and snails, in the class Mollusca. Mr. Yarrell, upon careful examination, assigned to it its proper place, as belonging to the class of fishes, at the end of the Lamprey Family.

This distinguished naturalist says, "The only specimen I ever saw was taken by Mr. Couch, who found it on the shore near Polperro. A portion of the tail of this little fish was sticking out from underneath a pool left by the tide; perceiving it, he took it up with some water in the hollow of his hands. It was alive, very active, and so transparent, that the viscera were perceivable through the external covering." At first sight, it a good deal resembles the Anglesea Morris, particularly in the arrangement of the striated lines on the flattened side; but that animal has a perfect head, though a small one, with jaw, eyes, and gill-covers; while the Lancelet has no proper head, nor eye, nor gills, neither has it any fins except one along the back. Scarcely could it have been credited that such striking deficiencies could be found to exist in a true fish; and, in fact, it was only the most intimate acquaintance with the minutest of these lowest links in the scale of animated life, aided by the use of powerful microscopes, that could have enabled the indefatigable students of nature to arrive at satisfactory conclusions in such an instance. Several relations to the Lampreys and Myxine are seen in its structure, especially in the mouth, which is flexible, and fringed with delicate appendages. It is worthy of remark that recently a second species has been discovered off Algiers, which possesses a circular mouth; a fact which seems to demonstrate the correctness of the decision which had associated the Lancelet with the Family of the Round-mouthed Fishes.

Thus is our pleasing task brought to a conclusion; and now what remains but that both the reader and the writer should join in admiring the infinite power, skill, and benevolence of God, all whose works praise Him? From the greatest even to the most minute, all bear the indelible impress of His mind and hand, and are therefore ever worthy of being examined and studied. In a sort of rapture the holy Psalmist exclaimed, when he had been considering these things, "O Lord, how manifold are thy works! In wisdom thou hast made them all: the earth is full of thy riches; so is this great and wide sea, wherein are things creeping innumerable, both small and great beasts. There go the ships; there is that Leviathan, whom thou hast made to play therein. These wait all upon thee, that thou mayest give them their meat in due season. That thou givest them, they gather; thou openest thine hand, they are filled with good." It is indeed worthy of our admiration how mindful the gracious Creator and Preserver is of His creatures' well-being, both in the provision He has made for the supply of their wants, and in the marvellous instincts with which He has endowed them, by the exercise of which they take advantage of His bounty, and find delight in the very act of doing so.

He has but a contracted mind, bound down by a debasing selfishness, who measures his regard for any object only by the degree of profit or comfort it ministers to himself; the Christian's heart takes a far wider range, and feels its highest gratification in the thought that the perfections of God shine forth more luminously the more His handiwork is examined. It is the Christian only who knows how to turn creation to account, who reads with understanding the lesson it is designed to teach, and comprehends the message it is perpetually delivering. Every glorious demonstration of Almightiness put forth by the processes of nature, speaks to him of what a guardian and upholder he has. What a privilege to be able to say, "My help cometh from the Lord, which made heaven and earth!" How delightful to remember that it is said of the Lord Jesus Christ, "By *Him* were all things created that are in heaven and in earth;" to know that the Being, at whose word the universe sprang into existence, is our Saviour, mighty to help the soul and to save it from death; all powerful to redeem, as well as to create; infinite in mercy, as He is in power! This glorious truth it is that binds the universe about with cords of love, and makes every believing soul glad and thankful.

"Creatures with all their endless race
His power and praise proclaim;
But saints that taste His richer grace,
Delight to bless His name."

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